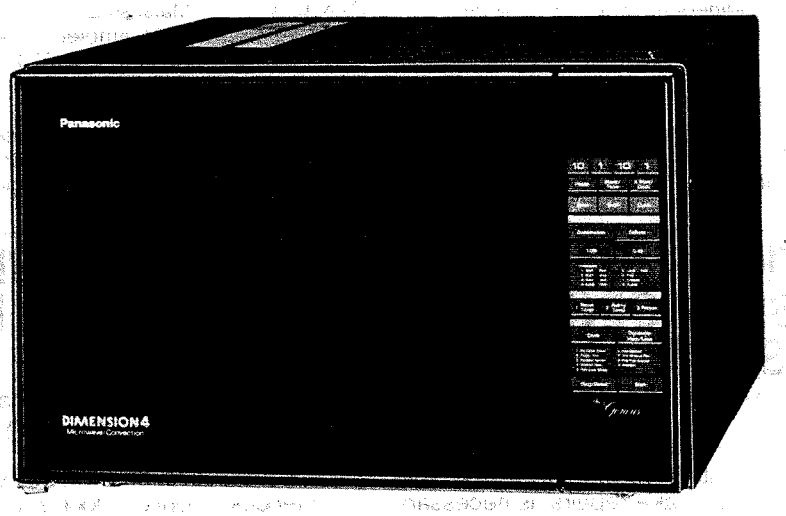
393

ORDER NO. CAD89080160C1
E1

# Service Manual

Microwave Oven

| MODEL | U.S.A. | CANADA |
|---|---|---|
| | APH | CPH |
| NN-9509 | ○ | — |
| NN-9809 | ○ | ○ |
| NN-9859 | ○ | ○ |




## Specifications

| | |
|---|---|
| Power Source : | 120 V AC Single Phase 60 Hz |
| Power Requirement : | Microwave : 1,400 W (12.2 A)<br>Heater : 1,500 W (12.5 A) |
| Output : | Microwave : 700 W (Full Power)<br>Heater : 1,400 W |
| Oscillation Frequency : | 2,450 MHz |
| Timer : | 99 min. 99 sec. / 9 hr. 99 min. |
| Outside Dimensions : | 23-7/8" (W) × 18-7/8" (D) × 14-13/16" (H)<br>606 mm (W) × 481 mm (D) × 376 mm (H) |
| Oven Cavity Dimensions : | 16-1/4" (W) × 16-13/16" (D) × 9-1/2" (H)<br>412 mm (W) × 426 mm (D) × 242 mm (H) |
| Weight : | NN-9509/NN-9809 APH·····53 lbs (24.1 kg)<br>NN-9859 APH, NN-9809/NN-9859 CPH···59 lbs (26.9 kg) |
| Specifications subject to change without notice. | |

Panasonic®

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## WARNING

1. This product should be serviced only by trained qualified personnel.
2. Though this product has been manufactured in compliance with:
   "Federal Performance Standard 21 CFR Subchapter J" (D.H.H.S.): U.S.A. models
   or "Radiation Emitting Devices Act" (NHW): Canadian models
   it is very important all repairs should be made in accordance with procedures described in this manual to avoid being exposed to excessive microwave radiation.
3. Check for radiation leakage before and after every servicing according to the "procedure for measuring radiation leakage".
4. If the unit cannot be repaired on site, advise the customer not to use until unit be repaired.
5. Any serviceman who learns of any accident pertaining to microwave radiation leakage including the oven operating with open door should immediately notify the appropriate address listed below and Center for Devices and Radiological Health, DHHS.

| | | | |
|---|---|---|---|
| IN U.S.A. (MSC) | Matsushita Services Company<br>Division of Matsushita Electric<br>Corporation of America<br>50 Meadowland Parkway,<br>Secaucus, New Jersey 07094<br>Attention: Engineering Support Division,<br>(201) 348-7000 | IN PUERTO RICO (PSC) | PSC<br>San Gabriel Industrial Park<br>65th Infantry Ave. Km.9.5<br>Carolina, Puerto Rico 00630<br>(809) 750-4300 |
| | | IN CANADA (MELCA) | Matsushita Electric of Canada Limited<br>5770 Ambler Drive, Mississauga,<br>Ontario, L4W2T3<br>(416) 624-5010 |

6. There are special components used in the microwave oven which are important for safety. These parts are marked with a ⚠ on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent microwave leakage, shock, fire, or other hazards. Do not modify the original design.

# PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(A) Do not operate or allow the oven to be operated with the door open.

(B) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
   (1) Interlock operation
   (2) Proper door closing
   (3) Seal and sealing surfaces (arcing, wear, and other damage)
   (4) Damage to or loosening of hinges and latches.
   (5) Evidence of dropping or abuse

(C) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, waveguide or transmission line, and cavity for proper alignment, integrity and connections.

(D) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(E) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

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# FEATURE CHART (NN models)

| MODEL / FEATURE | NN-9809, NN-9859 | NN-9509 |
|---|---|---|
| CYCLIC DEFROST | ○ | ○ |
| 3-STAGE COOKING | ○ | ○ |
| AUTO SENSOR COOK | ○ | — |
| AUTO SENSOR REHEAT | ○ | — |
| AUTO WEIGHT DEFROST | ○ | ○ |
| AUTO REHEAT | — | ○ |
| AUTO WEIGHT COMBINATION | ○ | ○ |
| COMBINATION (TIME COOKING) | ○ | ○ |
| BAKING (AUTO PREHEATING) | ○ | ○ |
| BAKING (TIME COOKING) | ○ | ○ |
| BROILING (AUTO PREHEATING) | ○ | ○ |
| BROILING (TIME COOKING) | ○ | ○ |
| AUTO START | ○ | ○ |
| STAND/TIMER | ○ | ○ |
| MEMORY RECIPE (INCLUDES POPCORN) | — | ○ |
| DIGITAL CLOCK | ○ | ○ |

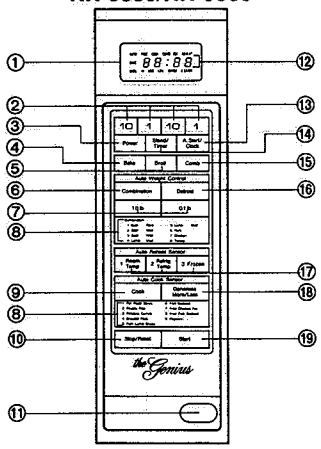
# FEATURE CHART (MQ models)

| MODEL / FEATURE | MQ8899W | MQ8869W |
|---|---|---|
| MULTI-STAGE DEFROST | ○ | ○ |
| 3-STAGE COOKING | ○ | ○ |
| HUMIDITY SENSOR COOK | ○ | — |
| HUMIDITY SENSOR REHEAT | ○ | — |
| AUTOMATIC WEIGHT DEFROST | ○ | ○ |
| PROGRAMMED REHEAT | — | ○ |
| AUTOMATIC WEIGHT COMBINATION | ○ | ○ |
| COMBINATION (TIME COOKING) | ○ | ○ |
| CONVECTION (AUTO PREHEATING) | ○ | ○ |
| CONVECTION (TIME COOKING) | ○ | ○ |
| BROILING (AUTO PREHEATING) | ○ | ○ |
| BROILING (TIME COOKING) | ○ | ○ |
| AUTO START | ○ | ○ |
| TIMER/STAND | ○ | ○ |
| RECIPE MEMORY | ○ | ○ |
| DIGITAL CLOCK | ○ | ○ |

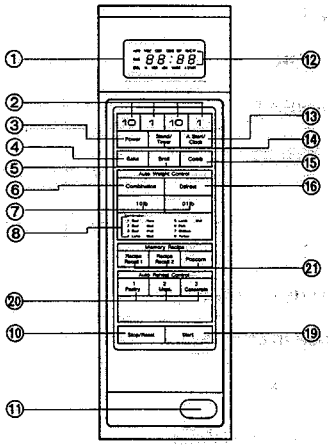
# CONTROL PANEL

## Control Panel

NN-9859/NN-9809



NN-9509

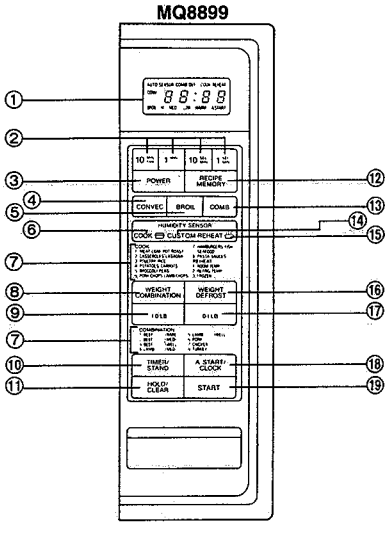


### Controls with Auto Count-Up Feature*

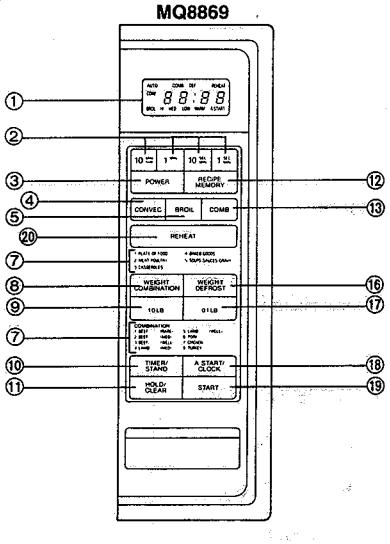
① Display Window
② Time Pads*
③ Power Pad*
④ Bake Pad*
⑤ Broil Pad
⑥ Auto Weight Combination Pad*
⑦ 1.0 lb/0.1 lb Pads*
⑧ Cooking Guide
⑨ Auto Sensor Cook Pad*
⑩ Stop/Reset Pad*
⑪ Door Release Button
⑫ Indicator Lights
⑬ A. Start/Clock Pad
⑭ Stand/Timer Pad
⑮ Combination Pad*
⑯ Auto Weight Defrost Pad
⑰ Auto Sensor Reheat Pads
⑱ Doneness Control Pad
More/Less Pad
⑲ Start Pad
⑳ Auto Reheat Control Pads*
㉑ Memory Recipe Pads
(including Popcorn Pad)

## Control Panel

MQ8899



MQ8869



### Controls with Auto Count-Up Feature*

① Display Window
② Time Pads*
③ Power Pad*
④ Convection Pad*
⑤ Broil Pad
⑥ Humidity Sensor Cook Pad*
⑦ Cooking Guide
⑧ Automatic Weight Combination Pad*
⑨ 1.0 Pound Pad*
⑩ Timer/Stand Pad
⑪ Hold/Clear Pad
⑫ Recipe Memory Pad
⑬ Combination Pad*
⑭ Custom Cook Pad
⑮ Humidity Sensor Reheat Pad*
⑯ Automatic Weight Defrost Pad
⑰ 0.1 Pound Pad*
⑱ A. Start/Clock Pad
⑲ Start Pad
⑳ Programmed Reheat Pad

# OPERATION AND DIGITAL PROGRAMMER CIRCUIT TEST PROCEDURE

## 1. To Set Clock

| OPERATION | DISPLAY |
|---|---|
| 1. Plug the power supply cord into wall receptacle. | 88:88 |
| 2. Tap Clock pad. | ✱ |
| 3. Enter time of day (TOD) by tapping appropriate number pads. | 11✱25 |
| 4. Tap Clock pad. TOD has now been registered into the digital programmer circuit and will count up by minutes. | 11:25 |

## 2. Time Cooking For Two Stage

| OPERATION | DISPLAY |
|---|---|
| 1. Place a water load in the oven. | |
| 2. Tap Power pad once for High power. (1st stage) | HIGH |
| 3. Set for 5 seconds by tapping Number pad. | 5<br>HIGH |
| 4. Tap Power pad 3 times for Medium power. (2nd stage) | MED |
| 5. Set for 10 seconds by tapping Number pad. | 10<br>MED |
| 6. Tap Start pad. | 5<br>HIGH |
| 7. When first stage cooking time has elapsed, oven automatically switches to 2nd stage cooking. | 10<br>MED |
| 8. When 2nd stage cooking time has elapsed, oven beeps 5 times and shuts off. | |

## 3. Auto Weight Defrost (NN models)

| OPERATION | DISPLAY |
|---|---|
| 1. Tap Auto Weight Defrost Pad | AUTO DEF<br>0.0 |
| 2. Set the weight for 3 pounds by tapping 1.0 (lb) pad three times. | AUTO DEF<br>3.0 |
| 3. Tap Start Pad. | AUTO DEF<br>36 00 |
| 4. Tap Stop/Reset Pad twice Oven shuts off. | TOD reappears in the display window. |

## 4. Automatic Weight Defrost (MQ models)

| OPERATION | DISPLAY |
|---|---|
| 1. Tap WEIGHT DEFROST Pad | AUTO DEF 0.0 |
| 2. Set the weight for 3 pounds by tapping 1.0 (LB) pad three times. | AUTO DEF 3.0 |
| 3. Tap START Pad. | AUTO DEF 36 00 |
| 4. Tap HOLD/CLEAR Pad twice Oven shuts off. | TOD reappears in the display window. |

## 5. Auto Reheat (NN-9509)

| OPERATION | DISPLAY |
|---|---|
| 1. Tap Auto Reheat 1 Pad 4 times. | AUTO REHEAT 1 - 4 |
| 2. Tap Start Pad. | AUTO REHEAT 50 |
| 3. When cooking time has elapsed.<br>• Oven beeps five times and shuts off. | • TOD reappears in the display window. |

## 6. Programmed Reheat (MQ8869W)

| OPERATION | DISPLAY |
|---|---|
| 1. Tap REHEAT Pad 4 times. | REHEAT 4 |
| 2. Tap START Pad. | REHEAT 15 |
| 3. When cooking time has elapsed.<br>• Oven beeps five times and shuts off. | • TOD reappears in the display window. |

## 7. Auto Sensor Cooking (NN-9809, NN-9859)

NOTE: Make sure that the outer panel is installed before Auto Sensor Cooking Test, since Auto Sensor function does not operate properly without the outer panel.

| OPERATION | DISPLAY |
|---|---|
| 1. Pour 150 ± 15cc (4.5 ± 1/2 ozs) of room temperature water in a beaker, securely cover the top of the beaker with plastic wrap and place the beaker in the center of the oven. | COVER THE TOP OF THE BEAKER WITH PLASTIC WRAP |
| 2. Tap Auto Sensor Cook Pad 6 times. | AUTO COOK 6 |
| 3. Tap Start Pad. | AUTO COOK 6 |
| 4. The humidity sensor detects steam about 2 to 5 minutes after the Start Pad is tapped.<br>Auto Sensor Cooking (T1) automatically switches to time cooking (T2).<br>"A6" disappears with beep sounds and the remainder of cooking time appears in display window.<br>NOTE: Cooking time will vary depending on the water temperature, the shape of beaker or the power source voltage.<br>NOTE: K factor for A6 program is 0.1. | AUTO COOK 9<br>AUTO COOK 27<br>NOTE: If 9 to 27 (9 seconds to 27 seconds) appears, AUTO SENSOR FUNCTION is normal. |
| 5. When the balance of cooking time has elapsed, oven stops and beeps five times. | • TOD reappears in the display window. |

## 8. Humidity Sensor Cooking (MQ8899W)

NOTE: Make sure that the outer panel is installed before Humidity Sensor Cooking Test, since Humidity Sensor function does not operate properly without the outer panel.

| OPERATION | DISPLAY |
|---|---|
| 1. Pour 150 ± 15cc (4.5 ± 1/2 ozs) of room temperature water in a beaker, securely cover the top of the beaker with plastic wrap and place the beaker in the center of the oven. | COVER THE TOP OF THE BEAKER WITH PLASTIC WRAP |
| 2. Tap HUMIDITY SENSOR COOK Pad 8 times. | SENSOR COOK 8 |

| OPERATION | DISPLAY |
|---|---|
| 3. Tap START Pad. | SENSOR COOK 8 |
| 4. The humidity sensor detects steam about 2 to 5 minutes after the START Pad is tapped. Humidity Sensor Cooking (T1) automatically switches to time cooking (T2). "A8" disappears with beep sounds and the remainder of cooking time appears in display window. NOTE: Cooking time will vary depending on the water temperature, the shape of beaker or the power source voltage. NOTE: K factor for A8 program is 0.1. | SENSOR COOK 9<br>SENSOR COOK 27<br>NOTE: If 9 to 27 (9 seconds to 27 seconds) appears, AUTO SENSOR FUNCTION is normal. |
| 5. When the balance of cooking time has elapsed, oven stops and beeps five times. | • TOD reappears in the display window. |

## 9. Bake Cooking with Preheat (NN models)

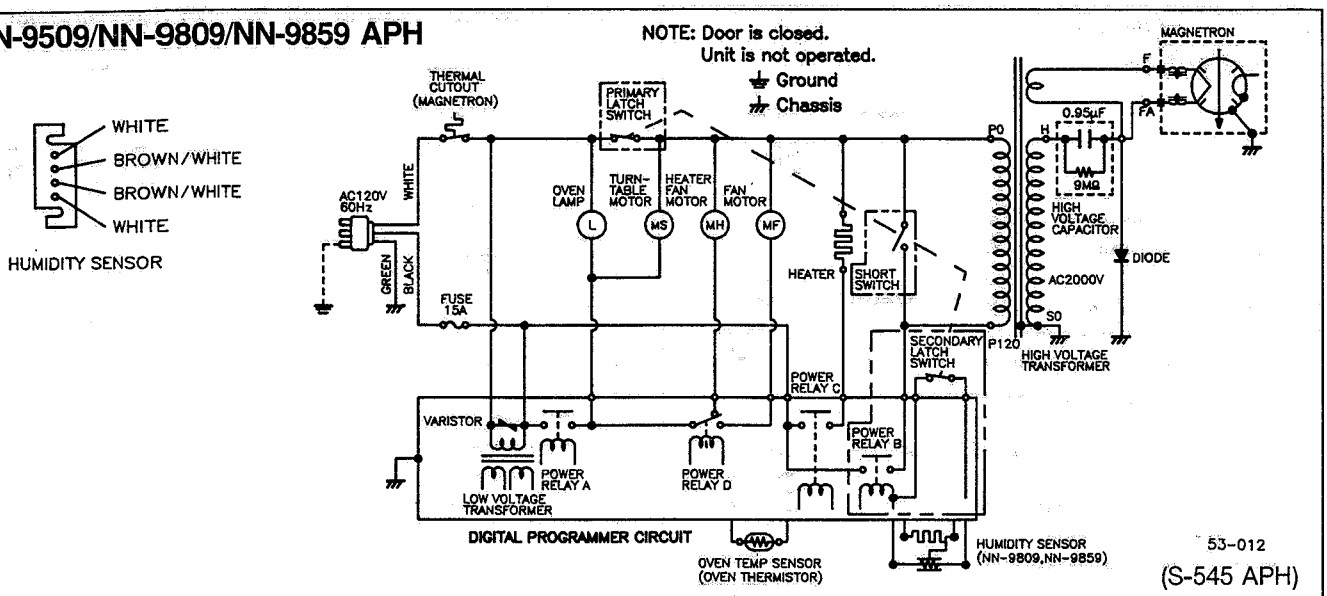
| OPERATION | DISPLAY |
|---|---|
| 1. Tap Bake pad twice. | BAKE 225F |
| 2. Tap Start pad. | BAKE P |
| 3. When preheating is completed, oven beeps 3 times. "P" begins to blink. | BAKE P |
| 4. After completion of preheating, be sure to open the door. | BAKE P |
| 5. Close the door and set bake cooking time for 2 minutes. | BAKE H 2 |
| 6. Tap Start pad. | BAKE 200 |

## 10. Convection Cooking with Preheat (MQ models)

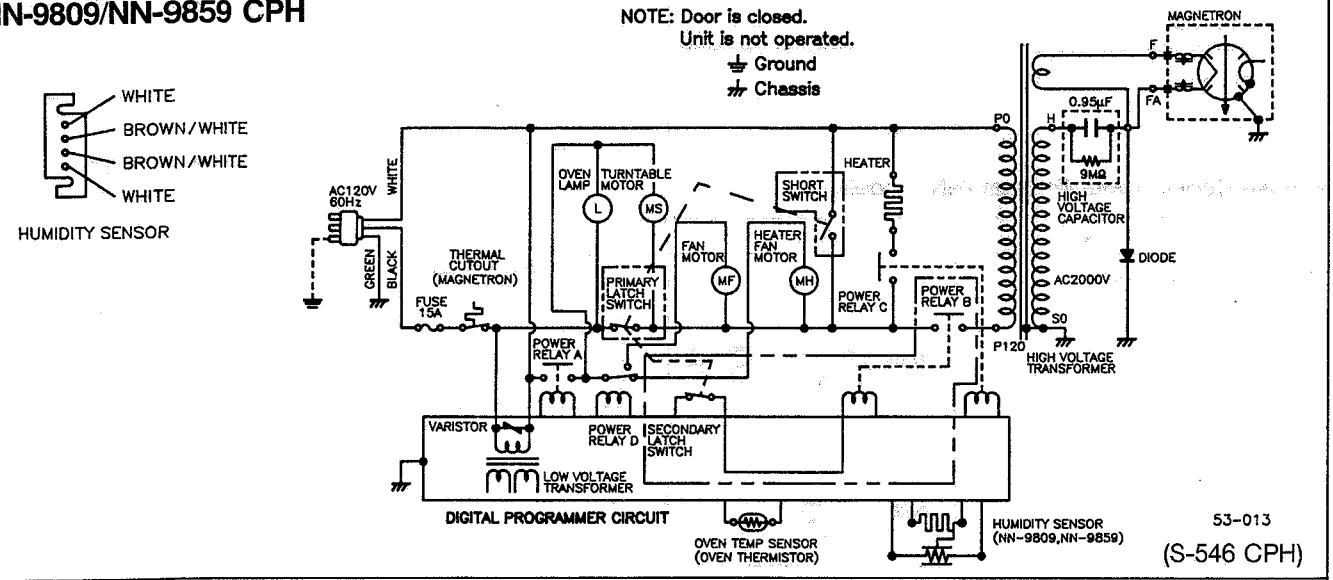
| OPERATION | DISPLAY |
|---|---|
| 1. Tap CONVEC pad twice. | CONV 225F |
| 2. Tap START pad. | CONV P |
| 3. When preheating is completed, oven beeps 3 times. "P" begins to blink. | CONV P |
| 4. After completion of preheating, be sure to open the door. | CONV P |
| 5. Close the door and set convection cooking time for 2 minutes. | CONV H 2 |
| 6. Tap START pad. | CONV 200 |

# SCHEMATIC DIAGRAM

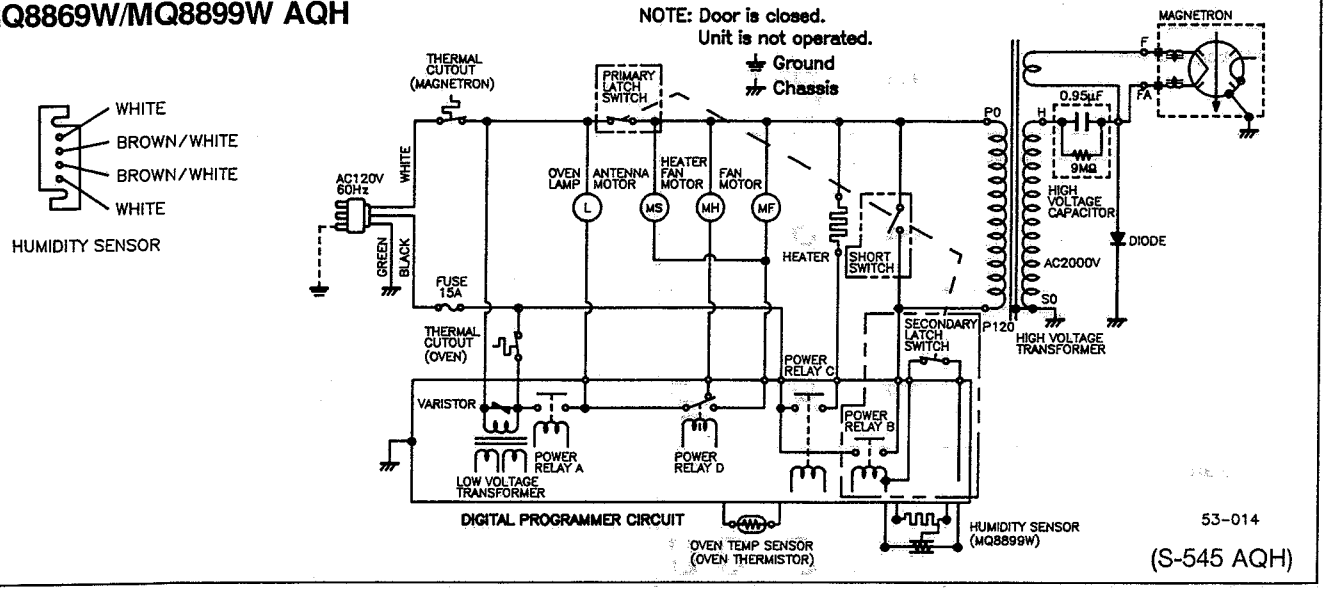
## NN-9509/NN-9809/NN-9859 APH




## NN-9809/NN-9859 CPH

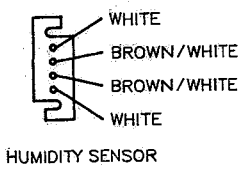



## MQ8869W/MQ8899W AQH



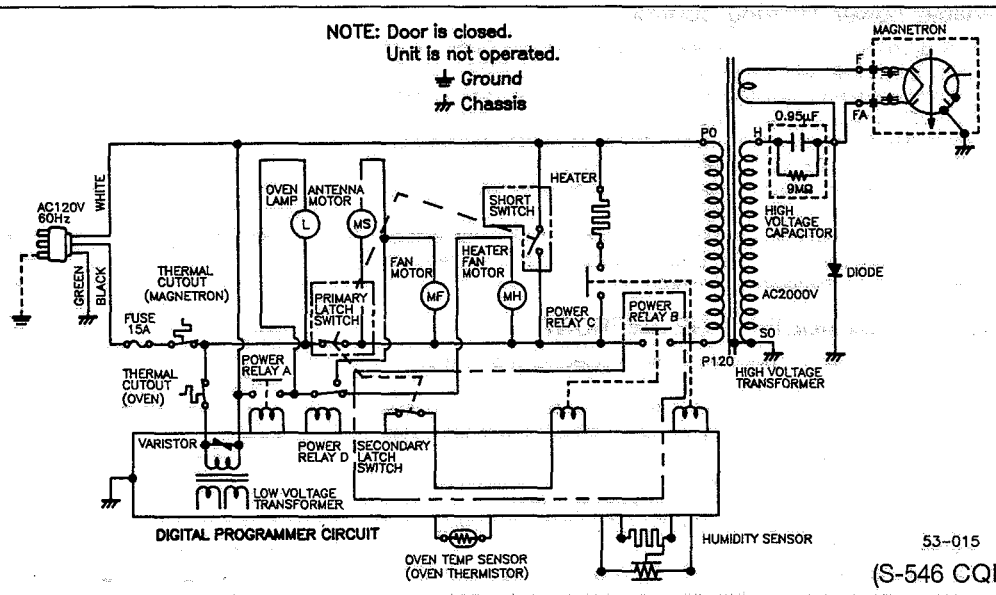
# SCHEMATIC DIAGRAM

## MQ8899W CQH



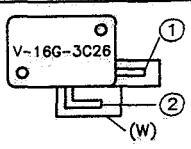
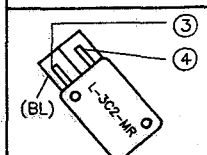
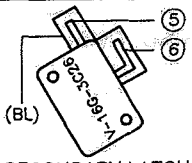
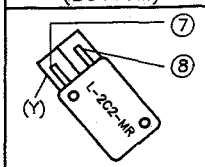

HUMIDITY SENSOR

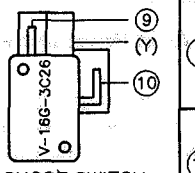
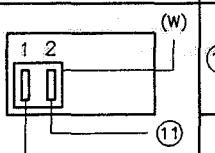
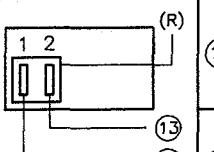
NOTE: Door is closed.
Unit is not operated.
Ground
Chassis




(S-546 CQH)

# WIRING DIAGRAM

| | | APH | CPH | AQH | CQH |
|---|---|---|---|---|---|
|  PRIMARY LATCH SWITCH (TOP) | ① | W/W/W | BR/B | W/W | B/BL |
| | ② | W/W | B/B | W/W | B/B |
|  SECONDARY LATCH SWITCH (BOTTOM) | ③ | BL | BL | —— | —— |
| | ④ | BL | BL | —— | —— |
|  SECONDARY LATCH SWITCH (BOTTOM) | ⑤ | —— | —— | BL | BL |
| | ⑥ | —— | —— | BL | BL |
|  SHORT SWITCH (BOTTOM) | ⑦ | W/Y | Y/Y | —— | —— |
| | ⑧ | BL | GR/BL | —— | —— |

| | | APH | CPH | AQH | CQH |
|---|---|---|---|---|---|
|  SHORT SWITCH (BOTTOM) | ⑨ | —— | —— | W/W | BL/W |
| | ⑩ | —— | —— | Y | B/B |
|  POWER RELAY B | ⑪ | BL/BL | BL | B/Y | GR |
| | ⑫ | B/B | B/GR | B/B | B/W |
|  POWER RELAY C | ⑬ | B | B | B | B |
| | ⑭ | —— | —— | —— | —— |

NOTE: *When replacing, check the lead wire colour as shown.
*Colours shown by ( ) indicate colours of lead wire connector housing.

| SYMBOL | COLOUR |
|---|---|
| OR | ORANGE |
| BL | BLUE |
| BR | BROWN |
| W | WHITE |
| Y | YELLOW |
| R | RED |
| GR | GRAY |
| B | BLACK |

53-016

# DESCRIPTION OF OPERATING SEQUENCE

## 1. Variable power cooking control

The coil of power relay B (RY2) is energized intermittently by the digital programmer circuit, when the oven is set at any power selection except for High power position. The digital programmer circuit controls the ON-OFF time of power relay B contacts in order to vary the output power of the microwave oven from "Warm" to "High" power. One complete ON and OFF cycle of power relay B is 22 seconds.
The relation between indications on the control panel and the output of the microwave oven is as shown in table.

NOTE: The ON/OFF time ratio does not correspond with the percentage of microwave power since approximately 2 seconds are required for heating of magnetron filament.

| POWER SETTING | OUTPUT POWER(W) APPROX. | ON-OFF TIME OF POWER RELAY B (RY2) | |
|---|---|---|---|
| | | ON(SEC) | OFF(SEC) |
| HIGH | 700 | 22 | 0 |
| MEDIUM | 490 | 17 | 5 |
| M.LOW | 360 | 13 | 9 |
| LOW | 200 | 8 | 14 |
| WARM | 70 | 4 | 18 |
| CYCLIC DEFROST | APPROX. 110W | Please refer to description of cyclic defrost | |

## 2. Cyclic defrost/MULTI-STAGE DEFROST

When defrost power and defrosting time is selected and Start pad is touched:

(A) The digital programmer circuit (DPC) divides the total defrosting time into 8 equal periods, consisting of four defrosting periods, each followed by a standing period.

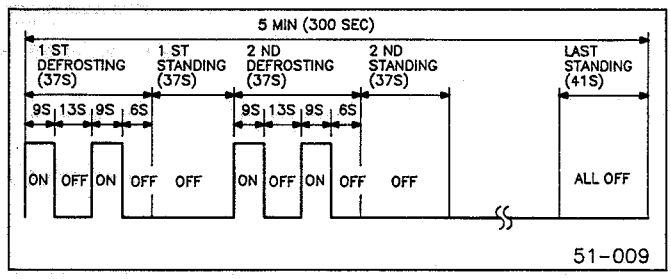
(B) During defrosting power periods, power relay B is energized for 9 seconds and de-energized for 13 seconds by DPC.

(C) During Standing periods, power relay B is always open resulting in no microwave power.

NOTE: Defrost time selected is converted into seconds by the DPC but display will show selected time in minutes and seconds as programmed. The total number of seconds is divided into 8 time periods. The remainder (seconds not equally divisible by 8) are added to the last standing time period.

Example: If Defrosting time is selected for 5 minutes, each operating period will be as follows :
5 minutes = 300 seconds
300/8 = 37 and remainder is 4 seconds.
The 4 seconds is added to the last time period.

NOTE: When defrosting time is selected for not more than 7 seconds, the power relay B will not be energized at all.




## 3. Auto/Automatic weight defrost, Auto/Programmed reheat control

When those Auto Control feature is selected and the Start Pad is tapped:

(A) The digital programmer circuit determines the power level and cooking time to complete cooking and indicates the operating state in the display window.
Table shows the corresponding cooking times for respective serving by categories.

(B) When cooking time in the display window has elapsed, the oven turns off automatically by a controll signal from the digital programmer circuit.

### Auto/Automatic Weight Defrost

| WEIGHT SELECTED | TOTAL DEFROSTING TIME |
|---|---|
| 1 LB | 12 min. 00 sec. |
| 3 LB | 36 min. 00 sec. |

### Auto Reheat (NN-9509)

| CATEGORY / SERVING | 1 Pastry | 2 Meat | 3 Casserole |
|---|---|---|---|
| 1 | 15 sec. | 1 min. 30 sec. | 3 min. 30 sec. |
| 4 | 50 sec. | 4 min. 00 sec. | 10 min. 30 sec. |

### Programmed Reheat (MQ8869W)

| CATEGORY | COOKING TIME |
|---|---|
| 1 | 3 min. 00 sec. |
| 2 | 1 min. 30 sec. |
| 4 | 15 sec. |

## 4. Baking/Convection cooking control

The digital programmer circuit controls the ON-OFF time of the heater in order to control oven cavity temperature.

(A) After the start pad is tapped with the desired baking/convection program set, an 18V DC signal comes out of the digital programmer circuit and is applied to coil of power relay C (RY4).

(B) When the contacts of power relay C close, power source voltage (120V AC) is applied to the heater and the heater turns on.

(C) When the oven temperature reaches the set temperature, the digital programmer circuit senses the temperature through oven temp sensor and stops supplying an 18V DC signal to the coil of power relay C and the heater turns off.

(D) After the heater turns off, the oven temperature will continue increasing a while and then decrease as shown in Figure. When the oven temperature drops below the set temperature, the digital programmer circuit senses the signal and starts supplying an 18V DC signal to the coil of power relay again.

NOTE: When Broil feature is selected, oven temperature is determined automatically as shown in Figure.

## 5. Combination cooking control

Combination cooking is accomplished by microwave and baking-/convection cooking being done alternately during one combination cooking cycle. One combination cooking cycle is 22 seconds.

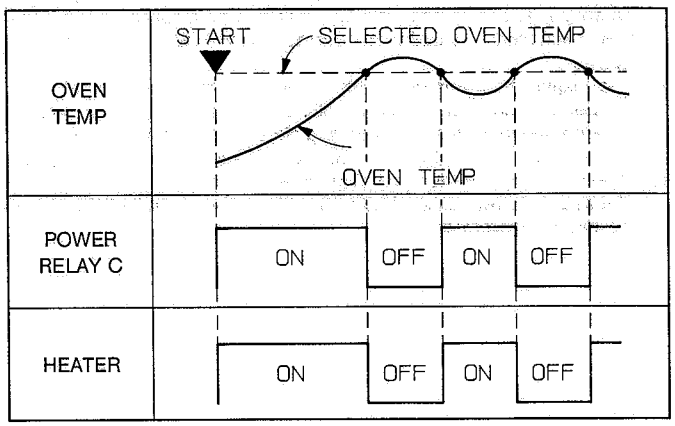
(A) During combination cooking, the digital programmer circuit controls ON-OFF time of both power relay B and C as shown in Figure.

(B) When the power relay B (RY2) is turned on, heater turns off and after the power relay B turns off, power relay C turns on.

NOTE 1: Note that the heater may not be on during a heater on period if the preprogrammed oven temperature has been reached. This is due to the fact that the oven is keeping the preprogrammed oven temperature constant, so of course the heater will only be on when it is needed and off when it is not needed.

NOTE 2: As for temperatures of combination cooking for convection, the temperatures by each program are preprogrammed in the microprocessor as shown in Figure.

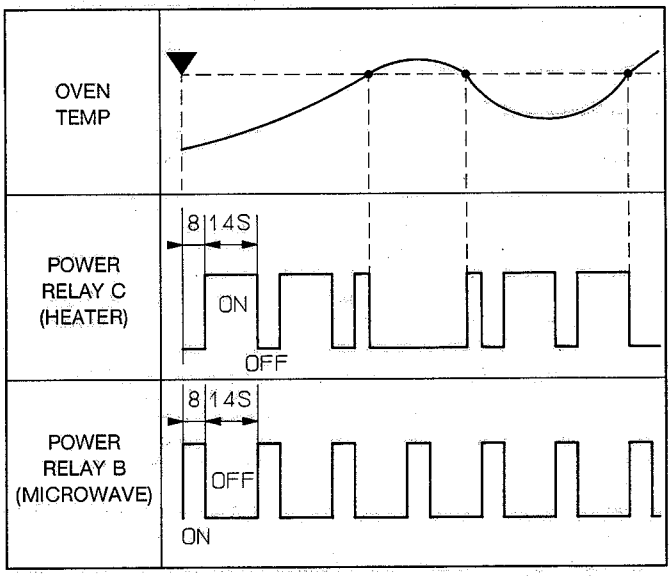
### Baking/Convection Cooking




### Broil Cooking

| CATEGORY | OVEN TEMP |
|---|---|
| 2 | 450°F |

### Combination Cooking




### Combination Cooking

| CATEGORY | MICROWAVE | HEATER | OVEN TEMP |
|---|---|---|---|
| 1 | 8/22 SEC | 14/22 SEC | 275°F |
| 2 | 8/22 SEC | 14/22 SEC | 300°F |
| 3 | 8/22 SEC | 14/22 SEC | 325° |
| 4 | 8/22 SEC | 14/22 SEC | 375°F |

## 6. Auto/Automatic weight combination cooking control

When the Auto/Automatic Weight Control, Combination Cooking feature is selected by tapping the appropriate key pads and Start pad is tapped.

(A) The digital programmer circuit determines the power level, oven temperature and combination cooking time to complete combination cooking and indicates the operating state in the display window. Table shows the combination cooking times for respective weights.

(B) When the combination cooking time in the display window has elapsed, the oven turns off automatically by the controlled signal from the digital programmer circuit.

**(NN models)**

| WEIGHT | TOTAL COMBINATION COOKING TIME | | | |
|---|---|---|---|---|
| SELECTED | CATEGORY 1 | CATEGORY 3 | CATEGORY 5 | CATEGORY 8 |
| 1 LB | 17 min. 00 sec. | 24 min. 00 sec. | 24 min. 00 sec. | 17 min. 20 sec. |
| 3 LB | 51 min. 00 sec. | 1 hour 12 min. | 1 hour 12 min. | 52 min. 00 sec. |
| 5 LB | 1 hour 25 min. | 2 hours 00 min. | — | 1 hour 26 min. |
| 12 LB | — | — | — | 3 hours 12 min. |

**(MQ models)**

| WEIGHT | TOTAL COMBINATION COOKING TIME | | | |
|---|---|---|---|---|
| SELECTED | CATEGORY 1 | CATEGORY 3 | CATEGORY 6 | CATEGORY 8 |
| 1 LB | 18 min. 00 sec. | 30 min. 00 sec. | 24 min. 00 sec. | 19 min. 00 sec. |
| 3 LB | 54 min. 00 sec. | 1 hour 30 min. | 1 hour 12 min. | 57 min. 00 sec. |
| 5 LB | 1 hour 30 min. | 2 hours 30 min. | — | 1 hour 35 min. |
| 12 LB | — | — | — | 3 hours 12 min. |

## 7. Auto/Humidity sensor cooking (NN-9809, NN-9859, MQ8899W)

*Auto/Humidity sensor cooking is a revolutionary way to cook by microwave without setting a power level or selecting a time.*
All that is necessary is to select an Auto/Humidity sensor Program before starting to cook.

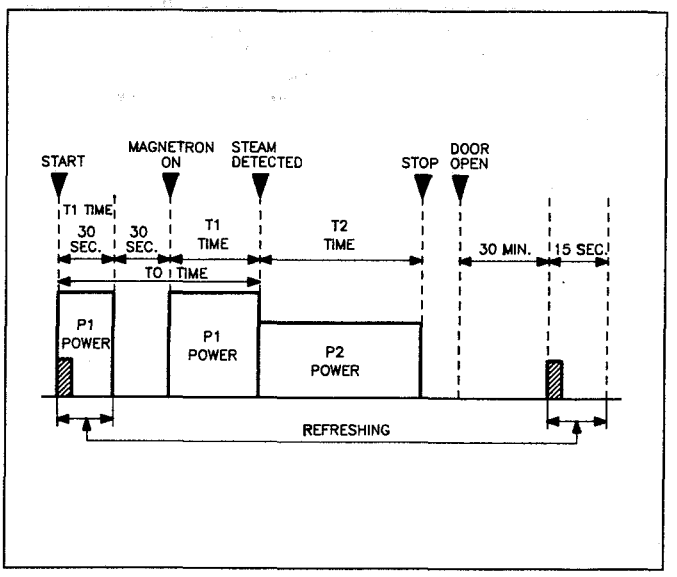
**Understanding of Cooking**

As food cooks, a certain amount of steam is produced. If the food is covered, this steam builds up and eventually escapes from the container. In Auto/Humidity Sensor Cooking, a carefully designed instrument, called the humidity sensor element, senses this escape of steam. Then, based upon the Auto/Humidity Sensor Program selected, the unit will automatically determine the correct power level and the proper length of time it will take to cook the food.

NOTE: *Auto/Humidity Sensor Cooking is successful with the foods and recipes found in the Auto/Humidity Sensor Cooking Guide. Because of the vast differences in food composition, items not mentioned in the Cooking Guide should be prepared in the microwave oven using power select and time features. Please consult Variable Power Microwave Cookbook for procedures.*

Explanation of the Auto/Humidity Sensor Cooking process

1) The shaded columns in Figure indicate when the humidity sensor heater is on.
2) During the 30 second period there is no microwave activity. When calculating the T2 time by using the formula below, make sure this 30 seconds is subtracted from the T0 time.
3) T1 time·····The total amount of time it takes the microwave oven. During this time one of the *Auto/Humidity sensor programs will be shown* in display.
4) T2 time·····When the steam escapes from the cooking container placed in the oven, the humidity sensor detects it and the microprocessor calculates the balance of cooking time. This T2 time is then shown in the display and begins counting down.



Balance of cooking time (T2 time)

The balance of cooking time which is called T2 time, can be calculated by the following formula.

T2 time (in sec.) =T1 time × K factor

NOTE: Remember, the T1 time starts after the Start pad is tapped. The coefficient K is programmed into the microprocessor memory and they are listed in the following tables along with the P1 and P2 powers.

NOTE: When "More" or "Less" pad is selected, the K factor varies resulting in T2 time to be increased or decreased.···**NN-9809, NN-9859**

NOTE: When CUSTOM COOK pad is selected, the K factor varies resulting in an increased or decreased T2 time.···**MQ8899W**

Example of calculating the T2 time

Example 1: If the T1 time is measured to be 2 minutes and 40 seconds, and the Auto/Humidity Sensor program selected is COOK 1

T2 = T1 × K
= 2 min. and 40 sec. × 2.5
= 160 sec. × 2.5
= 400 sec.
= 6 min. 40 sec.

## 8. Auto/Humidity sensor reheat (NN-9809, NN-9859, MQ8899W)

With Auto/Humidity sensor reheat, you can accurately reheat foods in accordance with their current state of preparation. This allows you to set the oven to reheat either: 1) Room temperature foods, 2) Refrigerated foods and 3) Frozen foods at their appropriate power levels and times. Best of all, Auto Sensor automatically does it all at the touch of a button!

NOTE: The Auto/Humidity sensor reheat, process is same as process.

### Auto Sensor Cook (NN-9809, NN-9859)

| | P1 Power | P2 Power | K factor Standard |
|---|---|---|---|
| A1 | MED | M.LOW | 2.5 |
| A8 | MED | LOW | 0.3 |

### Humidity Sensor Cook (MQ8899W)

| | P1 Power | P2 Power | K factor Standard |
|---|---|---|---|
| A1 | HIGH | M.LOW | 2.5 |
| A8 | HIGH | WARM | 0.1 |

### Auto Sensor Reheat (NN-9809, NN-9859)

| Category | P1 Power | P2 Power | K factor |
|---|---|---|---|
| 1. Room Temp Foods | HIGH | MED | 0.8 |

### Humidity Sensor Reheat (MQ8899W)

| Category | P1 Power | P2 Power | K factor |
|---|---|---|---|
| 1. Room Temp Foods | HIGH | MED | 0.8 |

# CAUTIONS TO BE OBSERVED WHEN TROUBLESHOOTING

Unlike many other appliances, the microwave oven is high-voltage, high-current equipment. Though it is free from danger in ordinary use, extreme care should be taken during repair.

**CAUTION**

Servicemen should remove their watches whenever working close to or replacing the magnetron.

## 1. Check the grounding

Do not operate on a 2-wire extension cord. The microwave oven is designed to be used when grounded. It is imperative, therefore, to make sure it is grounded properly before beginning repair work.

## 2. Warning about the electric charge in the high voltage capacitor

For about 30 seconds after the oven is turned off, an electric charge remains in the high voltage capacitor.
When replacing or checking parts, remove the power plug from the outlet and short the terminal of the high voltage capacitor (terminal of lead wire from diode) to chassis ground with an insulated handle screwdriver or insulated jumper lead wire to discharge.

**WARNING**

There is high-voltage present, with high-current capabilities in the circuits of the high voltage winding and filament winding of the high voltage transformer. It is extremely dangerous to work on or near these circuits with oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

**WARNING**

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

## 3. When parts must be replaced, remove the power plug from the outlet.

## 4. When the 15 Amp fuse is blown due to the operation of short switch:

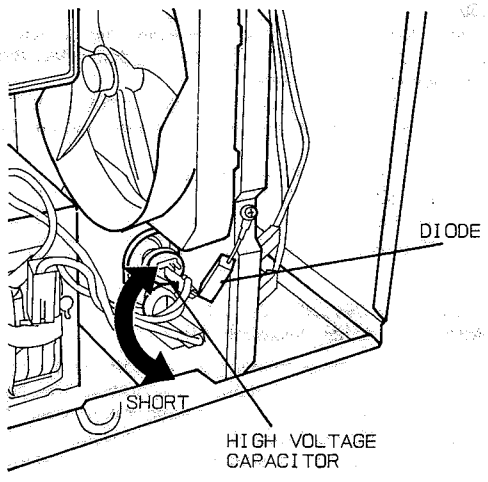
**WARNING**

When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. For U.S.A. models, also replace power relay B when the continuity check reads shorted contacts (1-2).

(A) This is mandatory. Refer to "Adjustments and Measurement" for these switches.
(B) When replacing the fuse, confirm that it has the appropriate rating for these models.
(C) When replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.

## 5. Avoid inserting nails, wire, etc. through any holes in the unit during operation.

Never insert a wire, nail or any other metal object through the lamp holes on the cavity or any other holes or gaps, because such objects may work as an antenna and cause microwave leakage.




Touch chassis side first then short to the high voltage capacitor terminal.

## 6. Confirm after repair

(A) After repair or replacement of parts, make sure that the screws of the oven, etc. are neither loose nor missing.
Microwaves might leak if screws are not properly tightened.
(B) Make sure that all electrical connections are tight before inserting the plug into the wall outlet.
(C) Check for microwave energy leakage. (Refer to procedure for measuring microwave energy leakage).

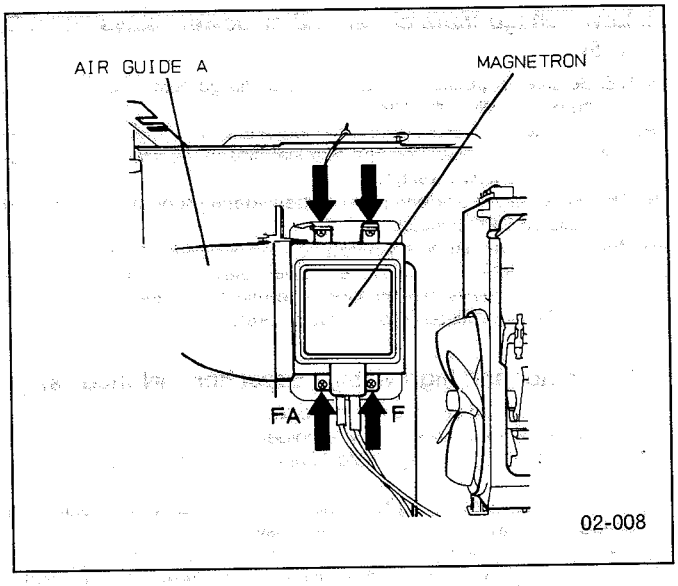
# DISASSEMBLY AND PARTS REPLACEMENT PROCEDURE

## 1. Magnetron

(A) Discharge the high voltage capacitor.
(B) Remove 2 screws holding air guide A.
(C) Remove 1 screw holding air guide B. (MQ models)
(D) Disconnect 2 high voltage lead wires from magnetron filament terminals.
(E) Remove 4 screws holding the magnetron.
NOTE: After replacement of the magnetron, tighten mounting screws properly making sure there is no gap between the waveguide and the magnetron to prevent microwave leakage.

**CAUTION**
When replacing the magnetron, be sure the antenna gasket is in place.

**CAUTION**
When connecting 2 filament lead wires to the magnetron terminals, be sure to connect the lead wires in the correct position. The lead wire of high voltage transformer should be connected to "F terminal" and the lead wire from high voltage capacitor should be connected to "FA terminal".

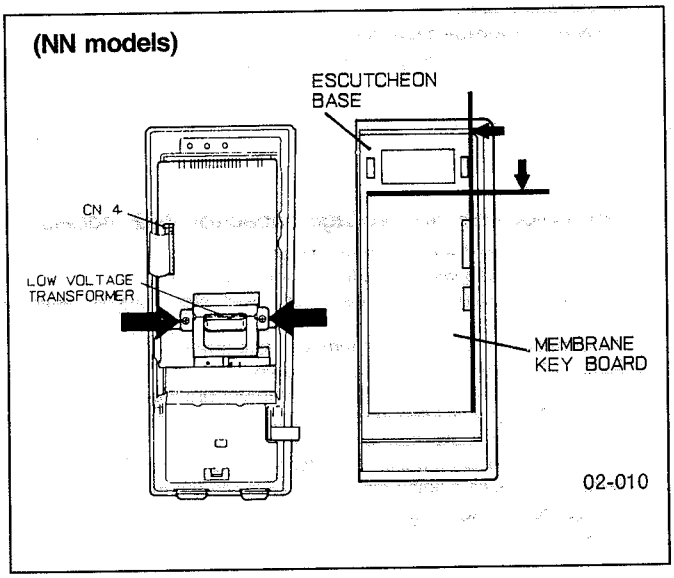



## 2. Digital programmer circuit (DPC) and membrane key board. (NN models)

NOTE: Be sure to ground any static electric charge built up on your body, before handling the DPC.
(A) Disconnect all connectors from D.P.C.
(B) Remove 1 screw holding escutcheon base and slide the escutcheon base upward slightly.
(C) Release CN4 connector's lock of DPC by pushing both levers to inside and pull them upward, and remove flat cable of membrane key board.
(D) Remove 2 screws holding DPC.

**To replace membrane key board**

(E) Remove escutcheon bracket from escutcheon base by freeing 4 catch hooks on the escutcheon base.
(F) Push the upper part of key board sheet (display window portion) from back of escutcheon base and peel key board sheet.
(G) Peel off membrane key board from escutcheon base.
NOTE: 1. The membrane key board is attached to the escutcheon base with double faced adhesive tape.
2. When installing new membrane key board, make sure that the surface of escutcheon base is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.

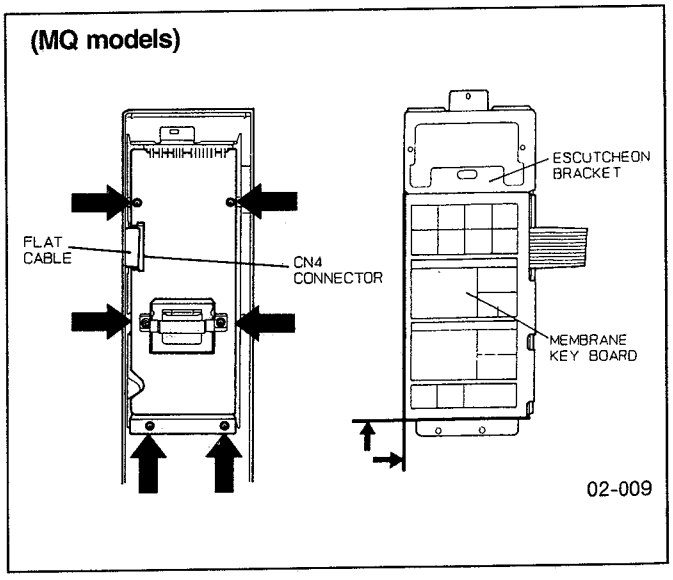



## 3. Digital programmer circuit (DPC) and membrane key board.(MQ models)

NOTE: Be sure to ground any static electric charge built up on your body, before handling the DPC.
(A) Disconnect all connectors from D.P.C.
(B) Remove 2 screw holding escutcheon base and slide the escutcheon base upward slightly.
(C) Release CN4 connector's lid and pull off the flat cable of the membrane key board.
(D) Remove 4 screws holding DPC.

**To replace membrane key board**

(E) Remove 2 screws holding escutcheon bracket to the escutcheon base.
(F) Peel off the membrane key board from the escutcheon bracket.
NOTE: 1. The membrane key board is attached to the escutcheon bracket with double faced adhesive tape.
2. When installing new membrane key board, make sure that the surface of escutcheon bracket is cleaned sufficiently so that any problems (shorted contacts or uneven surface) can be avoided.
3. Make sure that new membrane key board is aligned to the left and lower edges of the escutcheon bracket.



## 4. Low voltage transformer and/or power relays (RY1, 2, 4, 5)

NOTE: Be sure to ground any static electric charge built up on your body before handling the DPC.

(A) Using solder wick or a desoldering tool and 30W soldering iron, carefully remove all solder from the terminal pins of the low voltage transformer and/or power relays.

NOTE: Do not use a soldering iron or desoldering tool of more than 30 watts on DPC contacts.

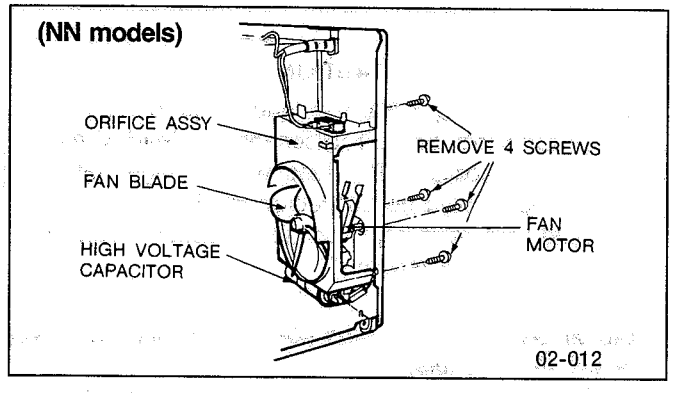
(B) With all the terminal pins cleaned and separated from DPC contacts, remove the defective transformer/power relays and install new transformer/power relays making sure all terminal pins are inserted completely. Resolder all terminal contacts carefully.

## 5. Fan motor and high voltage capacitor (NN models)

(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 2 lead wires from fuse holder terminals.
(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
(D) Remove 4 screws holding fan motor and orifice assy and detach the orifice assy with fan motor from oven assy.
(E) Remove fan blade from the fan motor shaft by pulling it straight out.
(F) Separate the fan motor from the orifice assy by freeing 2 catch hooks on the orifice assy.

To replace high voltage capacitor

(G) Remove 1 screw holding high voltage capacitor

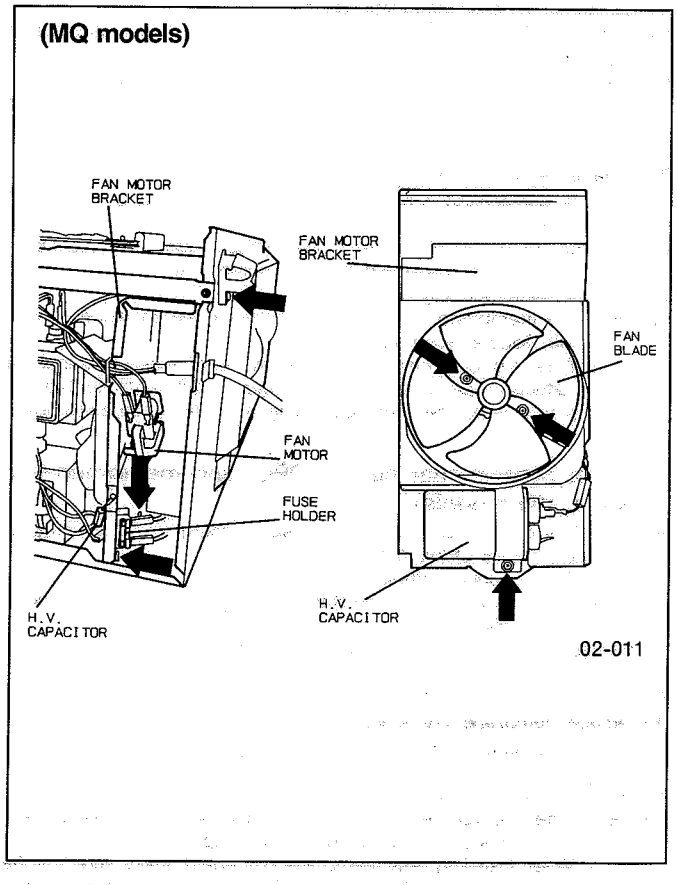



## 6. Fan motor and high voltage capacitor (MQ models)

(A) Disconnect 2 lead wires from fan motor terminals.
(B) Disconnect 2 lead wires from fuse holder terminals.
(C) Disconnect 4 high voltage lead wires from high voltage capacitor terminals.
(D) Disconnect 1 lead wire from thermal cutout terminal.
(E) Remove 1 screw from power supply cord.
(F) Remove 1 screw holding oven reinforcement bracket.
(G) Remove 3 screws holding fan motor bracket and detach the fan motor bracket with fan motor from oven assy.
(H) Remove fan blade from the fan motor shaft by pulling it straight out.
(I) Remove 2 screws holding the fan motor to the fan motor bracket.

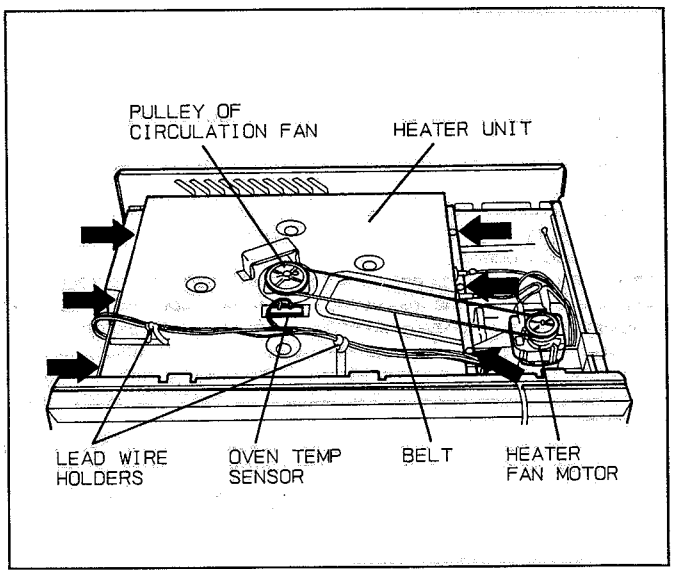
To replace high voltage capacitor

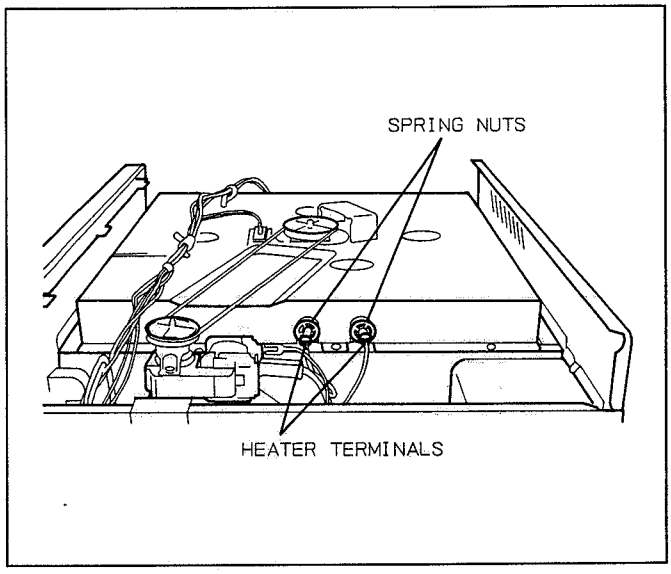
(J) Remove 1 screw holding high voltage capacitor.

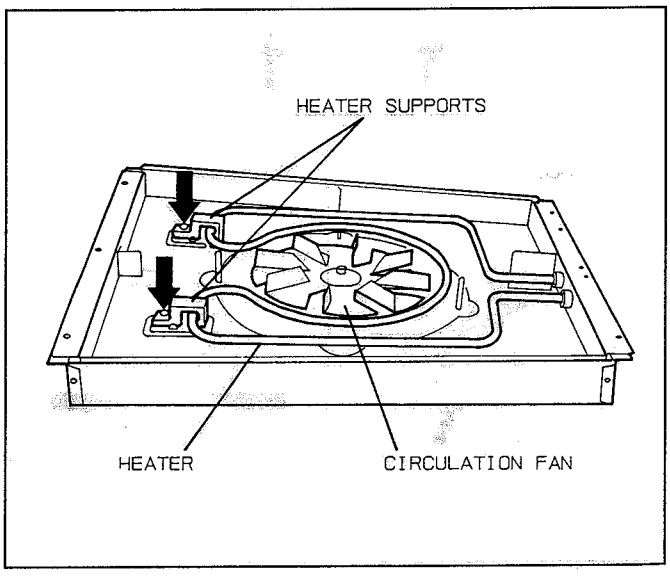


## 7. Heater

(A) Remove lead wires from lead wire holders.
(B) Remove belt from pulleys of circulation fan.
(C) Remove 2 screws holding oven temp sensor.
(D) Remove 2 lead wires from heater terminals by removing screws.
(E) Remove 4/6 screws holding the both sides of heater unit and lift it up carefully.
(F) Remove 2 spring nuts from heater terminals.
(G) Remove 2 screws holding heater supports and detach the heater.



## 8. Door assembly

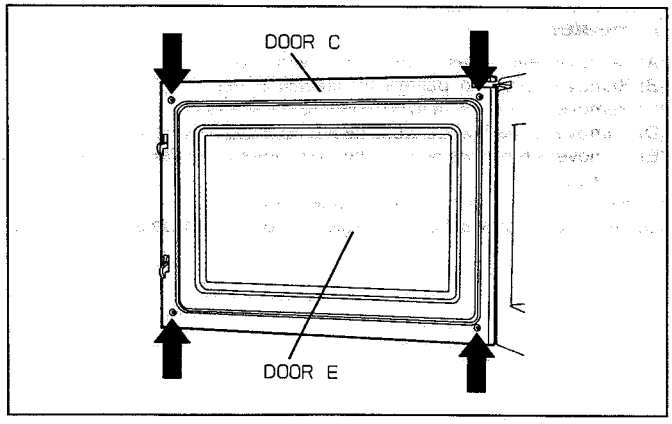
(A) Open the door and remove 4 screws holding door C.
(B) Remove the door C from door E by carefully pulling outward starting from upper right hand corner.
(C) Remove door key spring and remove 3 screws holding door handle. (MQ models)
(D) Separate the door A from the door E by freeing 8/6 catch hooks on the door A.
(E) Remove door key spring and door key. (NN models)
(F) Remove door keys, door key lever, door key spring and door key pins. (MQ models)

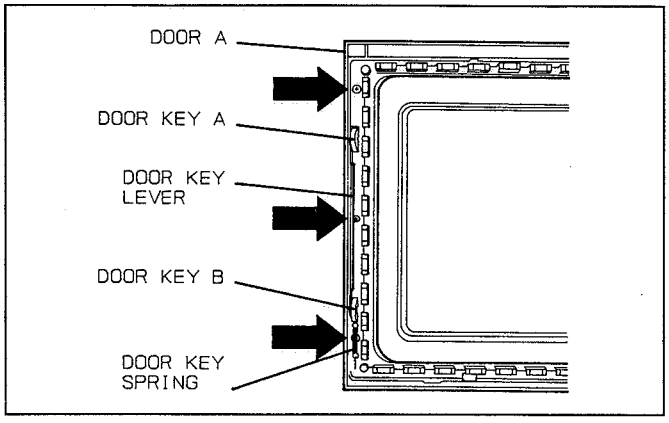
**After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.**

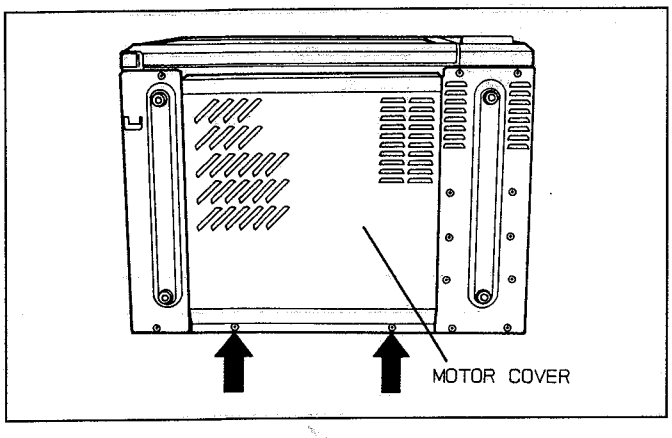
(1) When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
(2) Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave may leak from the clearance between the door and oven.
(3) Perform the microwave leakage test.

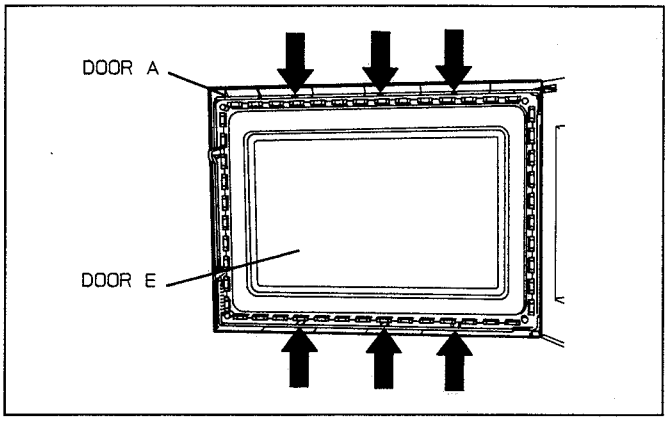
## 9. Turntable/Antenna motor

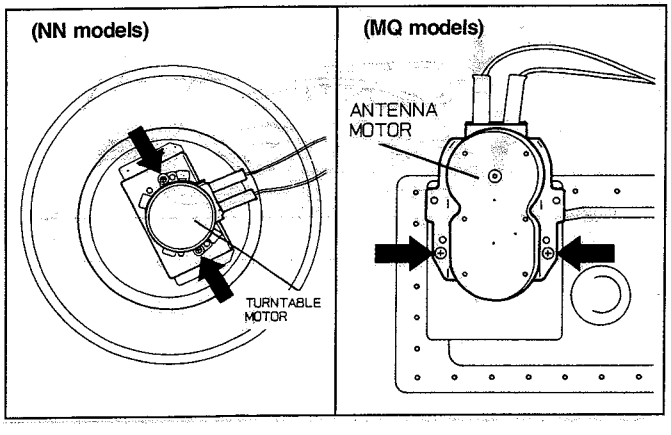
(A) Remove 2 screws holding motor cover.
(B) Disconnect 2 lead wires from turntable/antenna motor.
(C) Remove 2 screws holding turntable/antenna motor.

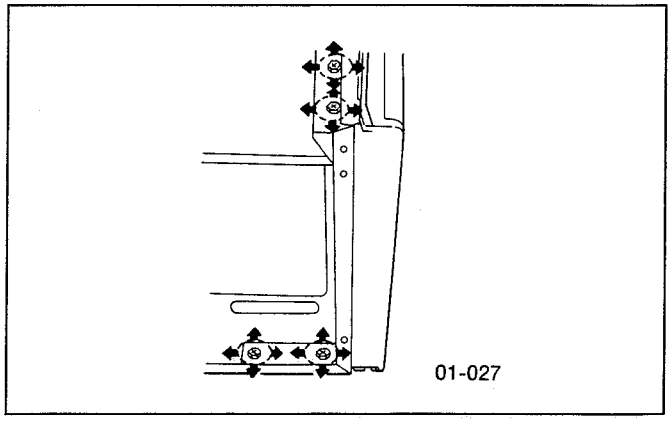


## 10. Floor shelf and/or moving antenna(MQ models)

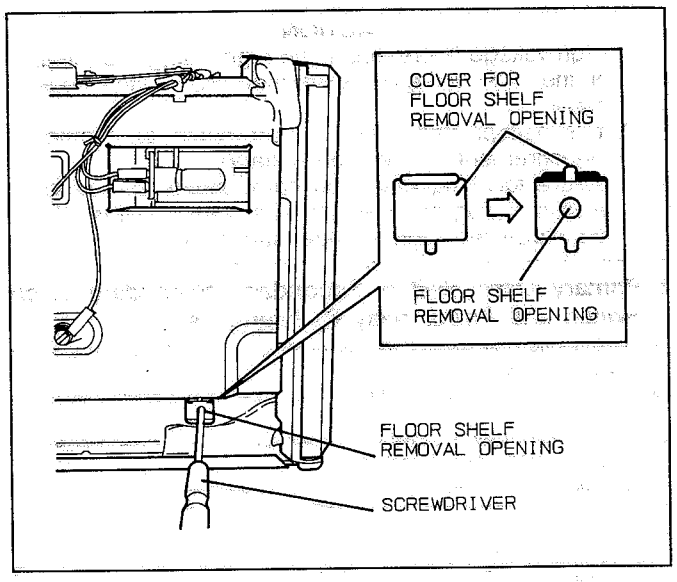
(A) Bend metal cover which covers the floor shelf removal opening located on left side oven wall and insert a phillips type screwdriver or equivalent approx.3" (7.5 cm) in shaft length in the hole.
(B) Carefully lift up the floor shelf by using the screwdriver until the floor shelf is lifted up over the level of oven opening front.
(C) Remove the floor shelf by lifting it up from oven front.

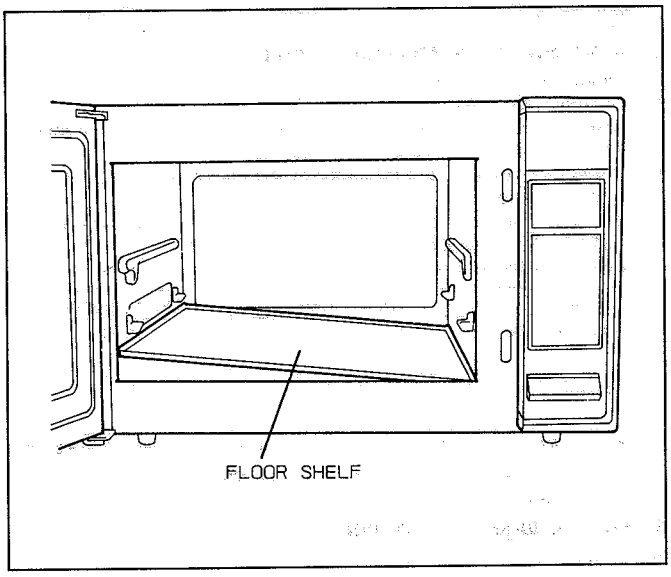
To replace the moving antenna.

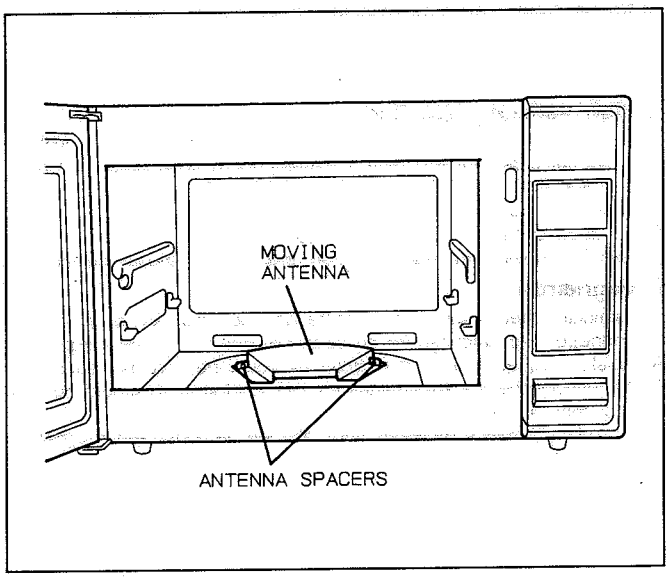
(D) Remove the moving antenna by simply lifting it up off the antenna motor shaft.

NOTE: When replacing the moving antenna, make sure the plastic antenna spacers are correctly in place.

(E) When installing floor shelf in position, make sure that front edge side of the floor shelf is inserted in position first then press down the rear side.



# COMPONENT TEST PROCEDURE

**CAUTION**

1. High voltage is present at the high voltage terminal of the high voltage transformer during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components, or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

## 1. Primary Latch Switch, Secondary (Secondary Latch Switch and Power relay B) Interlocks.

(A) Unplug lead connectors to Power Relay B and verify continuity of the power relay B 1-2 terminals.
(B) Unplug lead connectors to Primary Latch Switch and Secondary Latch Switch.
(C) Test the continuity of switches at door opened and closed positions with ohm meter (low scale).
Normal continuity readings should be as follows.

| | Door Opened | Door Closed |
|---|---|---|
| Primary Latch Switch | ∞ Ω (open) | 0 Ω (close) |
| Secondary Latch Switch | ∞ Ω (open) | 0 Ω (close) |
| Power Relay B | ∞ Ω (open) | ∞ Ω (open) |

## 2. Short Switch & Monitor Circuit

(A) Unplug lead wires from H.V. transformer primary terminals.
(B) For CPH/CQH only
make short circuit across the lead wires connected to power relay B (RY2) with temporary jumper wire for testing.
(C) Connect test probes of ohm meter to the disconnected leads which were connected to H.V. Transformer.
(D) Test the continuity of short switch with door opened and closed positions using lowest scale of the ohm meter.
Normal continuity readings should be as follows.

| Models | Door closed | Door opened |
|---|---|---|
| Touch Models | ∞ Ω | 0 Ω |
| Mechanical Models | Some Ohm See Note | 0 Ω |

NOTE: In this case, the ohm meter indicates some resistance of the part(s) such as oven lamp, blower fan motor, etc. connected in parallel with the monitor circuit.

## 3. High voltage transformer

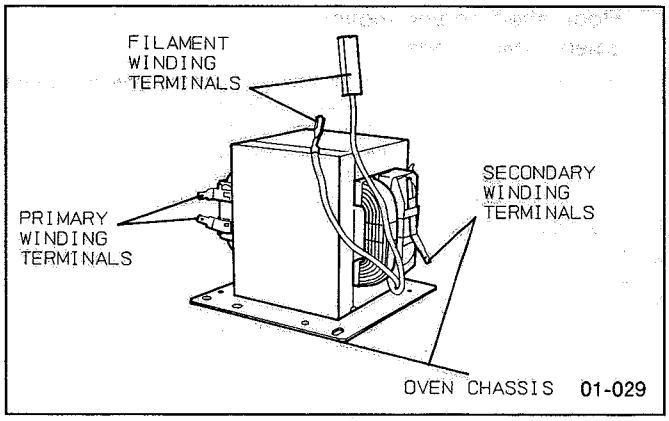
(A) Remove connections from the transformer terminals and check continuity.
(B) Normal (cold) resistance readings should be as follows:
Secondary winding ····· Approx. 80Ω~120Ω
Filament winding ····· Approx. 0Ω
Primary winding ····· Approx. 0Ω~ 1Ω

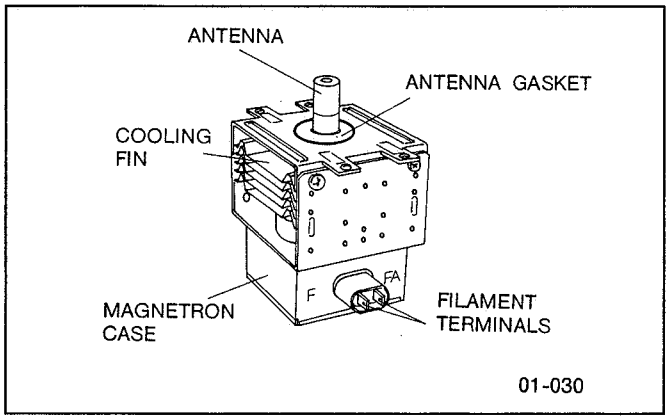
## 4. High voltage capacitor

(A) Check continuity of capacitor with meter on highest OHM scale.
(B) A normal capacitor will show continuity for a short time, and then indicate 9MΩ once the capacitor is charged.
(C) A shorted capacitor will show continuous continuity.
(D) An open capacitor will show constant 9MΩ.
(E) Resistance between each terminal and chassis should be infinite.

## 5. Magnetron

Continuity checks can only indicate an open filament or a shorted magnetron. To diagnose for an open filament or shorted magnetron.
(A) Isolate magnetron from the circuit by disconnecting the leads.
(B) A continuity check across magnetron filament terminals should indicate one ohm or less.
(C) A continuity check between each filament terminal and magnetron case should read open.



## 6. Diode

(A) Isolate the diode from the circuit by disconnecting the leads.
(B) With the ohmmeter set on the highest resistance scale, measure the resistance across the diode terminals. Reverse the meter leads and again observe the resistance reading. Meter with 6V, 9V or higher voltage batteries should be used to check the front-to-back resistance of the diode, otherwise an infinite resistance may be read in both directions.
A normal diode's resistance will be infinite in one direction and several hundred kΩ in the other direction.

## 7. Membrane key board (Membrane switch assembly)

Check continuity between switch terminals, by tapping an appropriate pad on the key board. The contacts assignment of the respective pads on the key board is as shown in digital programmer circuit.

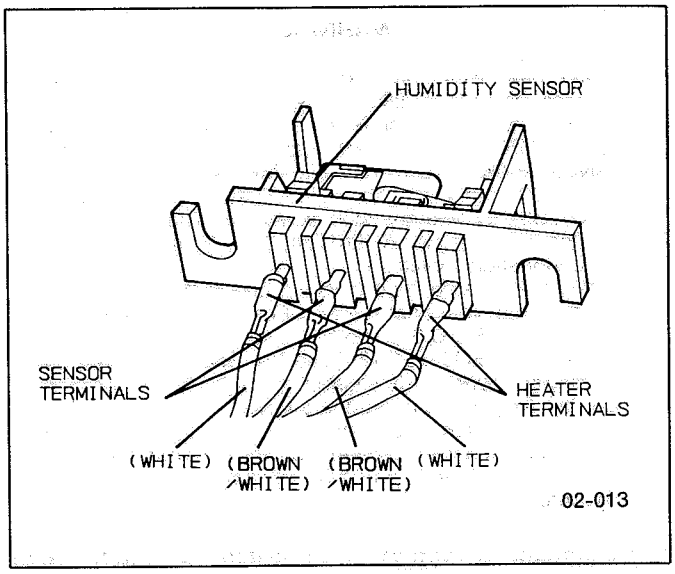
## 8. Humidity Sensor and digital programmer circuit

**CAUTION**
Do not touch any parts of the circuitry on the digital programmer circuit since static electric discharge may damage this control panel.
Always ground yourself while working on this panel to discharge any static charge built up on your body.

(A) Check across sensor heater terminals. Normal cold resistance should read approx. 4.5 ohm.
(B) In order to determine if the Auto/Humidity Sensor function of the digital programmer circuit is in working order or not, do the following test.
1) Place a water load in the oven.
2) Unsolder 2 brown/white wires connected to sensor terminals.
3) Tap Auto/Humidity Sensor COOK Pad 8 times to set auto/humidity sensor cooking at "8" and tap Start Pad.
4) About 10 seconds after Start Pad is touched, short 2 brown/white wires for 5 seconds and then remove them. Before shorting the 2 brown/white wires you can watch the sensor heater glow red.
5) Approx. 75 seconds after the Start Pad is pressed (T0 TIME), short the 2 brown/white wires again
6) "8" should disappear in display window and following digits (see chart) should appear indicating **balance of cooking time (T2 TIME). The time should start to count down and oven should shut off when the time has elapsed.

| * T0 TIME | ** T2 TIME (balance of cooking time) |
|---|---|
| 70 sec.~79 sec. | 12 sec. (NN-9809, NN-9859)<br>4 sec. (MQ8899W) |
| 80 sec.~89 sec. | 15 sec. (NN-9809, NN-9859)<br>5 sec. (MQ8899W) |

The Auto Sensor function in the digital programmer circuit is working in order if above condition is obtained.




## 9. Oven temp sensor thermistor

This sensor monitors the heat produced by the heater circuit and maintains the oven temperature the user had selected.Normal room temperature, especially in a kitchen can vary anywhere from 50°F to 90°F. The reading across the oven sensor thermistor should be within 360K ohm to 800K ohm when reading in an area within the 50°F to 90°F room temperature range.
If the resistance reading is out of the range stated here, the sensor is detective and must be replaced.

NOTE 1: When measuring resistance disconnect the 4-pin connector(CN3) from the DPC otherwise a false reading may be indicated.
2: If checking an oven sensor thermistor just after the microwave oven has been operating, the sensor of course won't be room temperature. In this case the sensor must be removed and allowed to cool down to the 50°F to 90°F range.

# MEASUREMENTS AND ADJUSTMENTS

**WARNING**

* For continued protection against radiation hazard, replace only with identical replacement parts (For NN models Part No. ANE61424L0AG, Type No. V-16G-3C26 for Primary latch switch Part No. A61424650AP, Type No. L-3C2-MR for Secondary latch switch and Part No. ANE6178-5R0, Type No. L-2C2-MR for short switch. For MQ models Part No. ANE61424L0AG, Type No. V-16G-3C26 for Primary latch switch and Secondary latch switch and Part No. ANE61784L0AG, Type No. V-16G-2C25 for short switch.)
* When the 15 Amp. fuse is blown due to the operation of short switch, you must replace Primary latch switch and short switch. For U.S.A. models, also replace power relay B (Part No. AEG5J1EG12, Type No. G5J-1-TP) when the continuity check reads shorted contacts (1—2). Then follow the adjustment procedures below.
* Interlock switch replacement — In replacing faulty switches, be sure mounting tabs are not bent, broken or otherwise deficient in their ability to hold the switches.
* Refer to schematic diagram to ensure proper connection.

## 1. Adjustment of Primary latch switch, Secondary latch switch and short switch

(A) When mounting Primary latch switch, Secondary latch switch and short switch to door hook assembly, mount the Primary latch switch, the Secondary latch switch and the short switch to the door hook assembly as shown in table.

NOTE: No specific adjustment during installation of Primary latch switch, Secondary latch switch and short switch to the door hook is necessary.

(B) When mounting the door hook assembly to the oven assembly, adjust the door hook assembly by moving it in the direction of arrow in table so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the door hook assembly to the oven assembly.

(C) Reconnect the short switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.

## 2. Measurement of microwave output

The power output of the magnetron can be determined by performing a simple water heating test as described below.

Necessary Equipment:

*Two 1 liter beakers *Glass thermometer

*Wrist watch or stopwatch

NOTE: Check the line voltage under load. Low voltage will lower the magnetron output. Take the temperature readings and heating time as accurate as possible.

(A) Fill each beaker with exactly one liter of tap water. Stir the water using the thermometer and record each beaker's temperature (recorded as T1A and T1B).

(B) Place both beakers on the center of metal tray/shelf.
Set the oven for High power and heat it for exactly two minutes.

(C) Stir the water again and read the temperature of each beaker (recorded as T2A and T2B).

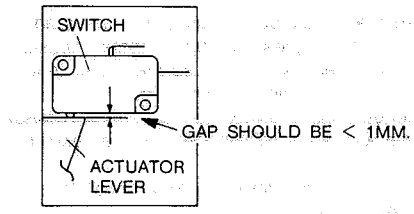
(D) Obtain the temperature rise by using the following formula:

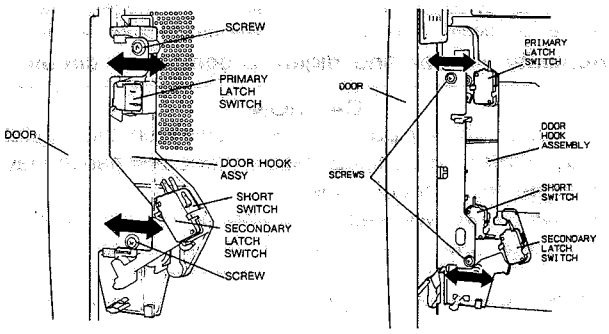
$$\text{Average temperature rise} = \frac{(T2A + T2B) - (T1A + T1B)}{2}$$

(E) The normal temperature rise at High power position for each models is as shown in table A.

(F) To obtain the power output, multiply the average temperature rise by 39 (or 70 if thermometer is in Celsius).
Example:
If you find average temperature rise of 18°F the ovens output is $18 \times 39 = 702$ watts.

NOTE: This test may be conducted by heating one liter of water for one minute if only one beaker is available. In this instance you will find the temperature rise being smaller than the above specifications due to the microwave absorption characteristic. You may judge the magnetron to be normal when the temperature rise is greater than temperature rise shown in table B.




**(NN models)** **(MQ models)**

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Please confirm that the gap between the switch housing and switch actuator levers is no more than 1.0mm when the door is closed.

**TABLE A (2 ℓ -2min. test)**

| RATED OUTPUT | TEMPERATURE RISE |
|---|---|
| 500W | 11.5—14.7°F (6.4—8.2°C) |
| 600W | 13.8—17.8°F (7.7—9.9°C) |
| 700W | 16.0—20.0°F (8.9—11°C) |

**TABLE B (1 ℓ -1min. test)**

| RATED OUTPUT | TEMPERATURE RISE |
|---|---|
| 500W | Min. 9.7°F (5.4°C) |
| 600W | Min. 11.5°F (6.5°C) |
| 700W | Min. 13.5°F (7.5°C) |

# PROCEDURE FOR MEASURING MICROWAVE ENERGY LEAKAGE

**WARNING**

Check for radiation leakage after every servicing. Should the leakage be more than 2 mW/cm² (1mW/cm² for Canada) inform the MSC, PSC, or MELCA immediately. After repairing or replacing any radiation safety device, keep a written record for future reference, as required by D.H.H.S and NHW regulation. This required must be strictly observed. In addition, the leakage reading must be recorded on the service repair ticket while in the customer's home.

NOTE: The U.S. government standard is 5 mW/cm² while in the customer's home. 2mW/cm² stated here is our own voluntary standard. (1mW/cm² for Canada)

## 1. Equipment

*Electromagnetic radiation monitor
*Glass thermometer 212°F or 100°C
*600cc glass beaker

## 2. Procedure for measuring radiation leakage.

*Note before measuring*

*(1) Do not exceed meter full scale deflection. Leakage monitor should initially be set to the highest scale.*
*(2) To prevent false readings the test probe should be held by the grip portion of the handle only and moved along the shaded area shown in* ***Figure*** *no faster than 1 inch/sec (2.5 cm/sec)*
*(3) Leakage with the outer panel removed·····less than 5mW/cm²*
*(4) Leakage for a fully assembled oven with door normally closed····· less than 2mW/cm² (1mW/cm² for Canada)*
*(5) Leakage for a fully assembled oven [Before the latch switch (primary) is interrupted] while pulling the door ·····less than 2mW/cm²*

(A) Pour 275 ± 15cc (9ozs ± 1/2oz) of 20 ±5°C (68 ± 9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
(B) Set the radiation monitor to 2450MHz and use it following the manufacturer's recommended test procedure to assure correct results.
(C) When measuring the leakage, always use the 2 inch (5cm) spacer supplied with the probe.
(D) Tap the start pad with the magnetron oscillating, measure the leakage by holding the probe perpendicular to the surface being measured.

**(1) Measurement with the outer panel removed.**

Whenever you replace the magnetron, measure for radiation leakage before the outer panel is installed and after all necessary components are replaced or adjusted. Special care should be taken in measuring around the magnetron.

**WARNING**

Avoid contacting any high voltage parts.

**(2) Measurements with a fully assembled oven.**

After all components, including the outer panel are fully assembled, measure for radiation leakage around the door periphery, the door viewing window, the exhaust opening and air inlet openings.

## 3. Record keeping and notification after measurement

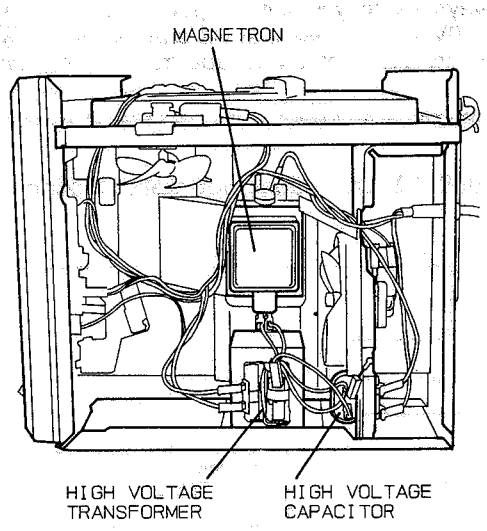
(A) After any adjustment or repair to a microwave oven, a leakage reading must be taken. Record this leakage reading on the repair ticket even if it is zero.
A copy of this repair ticket and the microwave leakage reading should be kept by repair facility.

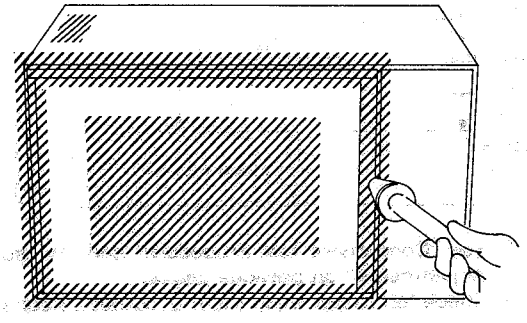
(B) Should the radiation leakage be more than 2 mW/cm² (1mW/cm² for Canada) after determining that all parts are in good condition, functioning properly, and genuine replacement parts as listed in this manual have been used, immediately notify the MSC, PSC or MELCA.

## 4. At least once a year, have the radiation monitor checked for calibration by its manufacturer.

**WARNING**

AVOID CONTACTING ANY HIGH VOLTAGE PARTS.



MOVE PROBE ALONG SHADED AREA (////,) AROUND EXHAUST OPENINGS (as shown) AND AROUND AIR INLET OPENING

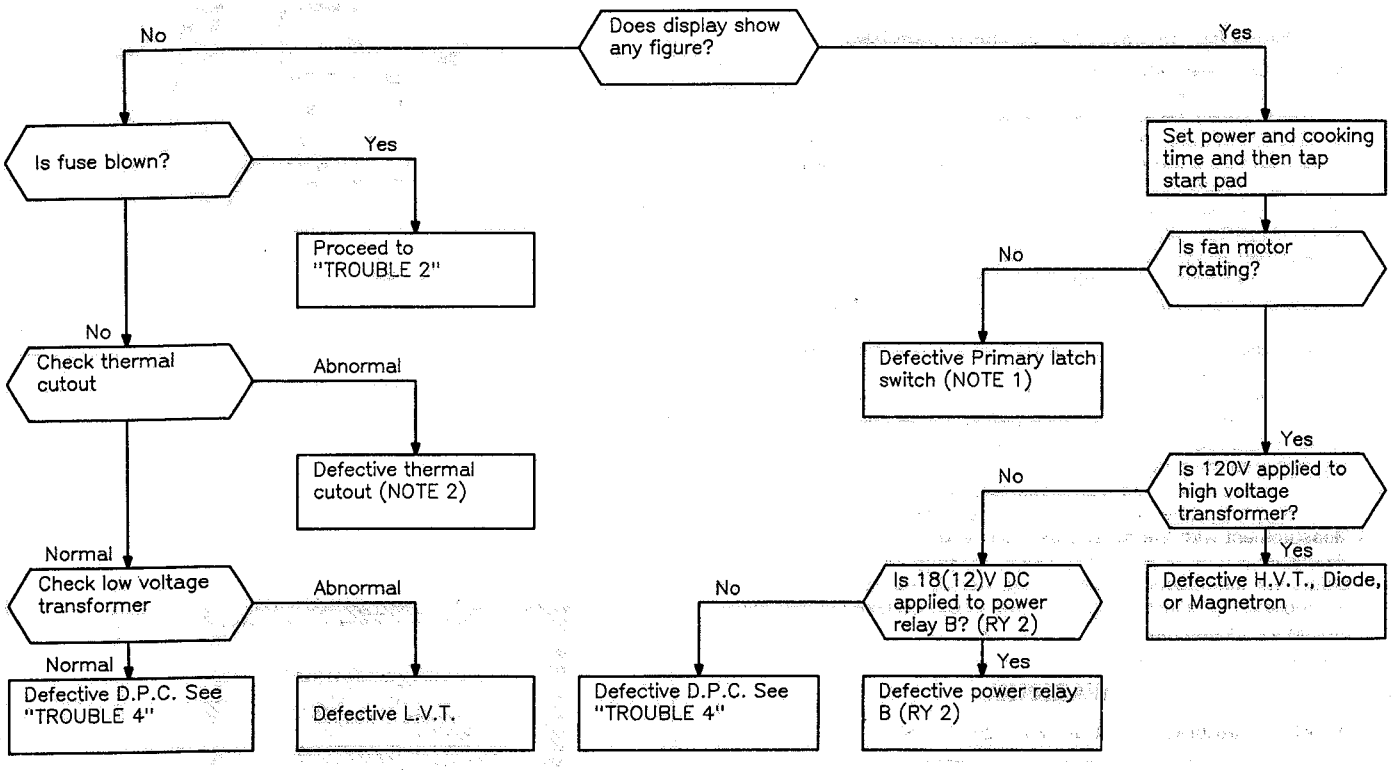
# TROUBLESHOOTING GUIDE

**CAUTION**

1. Check grounding before checking for trouble.
2. Be careful of the high voltage circuit.
3. Discharge high voltage capacitor.
4. When checking the continuity of the switches or the high voltage transformer, disconnect one lead wire from these parts and then check continuity with the AC plug removed. To do otherwise may result in a false reading or damage to your meter.
   When disconnecting a plastic connector from a terminal, you must hold the plastic connector instead of the lead wire and then disconnect it, otherwise lead wire may be open or the connector cannot by removed.
5. Do not touch any parts of the circuitry on the digital programmer circuit, since static electric discharge may damage this control panel.
   Always touch yourself to ground while working on this panel to discharge any static charge in your body.
6. A 120V AC is present at the shaded area ▩ of the digital programmer circuit (Terminals of power relay B and primary circuit of low voltage transformer). When troubleshooting, be cautious of possible electrical shock hazard.

First of all operate the microwave oven following the correct operating procedures in order to find the exact cause of any trouble.

## 【TROUBLE 1】 Oven does not start cooking




**NOTE 1: See "Component Test Procedure" and "Measurements and Adjustments" on previous pages.**
**NOTE 2: Check fan motor when thermal cutout (magnetron) is defective.**

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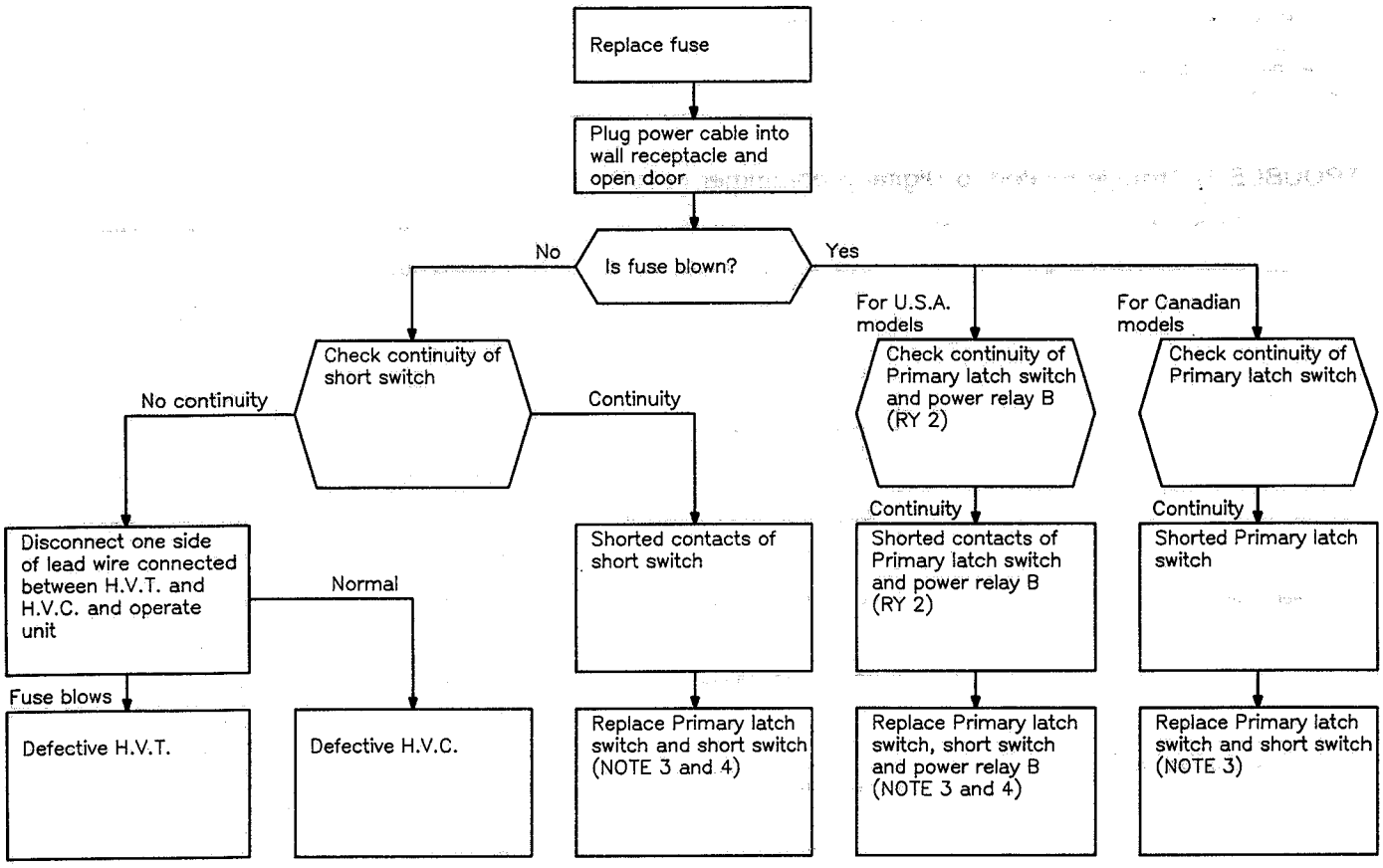
## 【TROUBLE 2】 Fuse is blown.


Replace fuse
Plug power cable into wall receptacle and open door
Is fuse blown?
No
Yes
For U.S.A. models
For Canadian models
Check continuity of short switch
No continuity
Continuity
Check continuity of Primary latch switch and power relay B (RY 2)
Check continuity of Primary latch switch
Continuity
Continuity
Disconnect one side of lead wire connected between H.V.T. and H.V.C. and operate unit
Normal
Shorted contacts of short switch
Shorted contacts of Primary latch switch and power relay B (RY 2)
Shorted Primary latch switch
Fuse blows
Defective H.V.T.
Defective H.V.C.
Replace Primary latch switch and short switch (NOTE 3 and 4)
Replace Primary latch switch, short switch and power relay B (NOTE 3 and 4)
Replace Primary latch switch and short switch (NOTE 3)

**NOTE 3: All these switches must be replaced at same time.**
**(Refer to adjustment instructions.)**
**NOTE 4: Check continuity of power relay B's contacts (between 1 and 2) and if it has continuity, replace power relay B too.**

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## 【TROUBLE 3】 Other troubles

| CONDITIONS | POSSIBLE CAUSE | NOTE |
|---|---|---|
| Microwave output power is low. First of all, check if output power is really low by following "Measurement of microwave output". | 1. Decrease in power source voltage.<br>2. Aging change of magnetron. | |
| Oven lamp and heater fan motor turn on when door is open. | 1. Shorted contacts of Primary latch switch. | For U.S.A. models only. |
| Oven lamp and heater fan motor turn on when power supply cord is plugged into wall receptacle. | 1. Open Secondary latch switch.<br>2. Shorted contacts of power relay A. (RY1)<br>3. Defective digital programmer circuit. (See trouble 4) | |
| Microwave oven does not operate normally, when auto sensor cooking is selected. | 1. Open or loose wiring of sensor terminals from DPC.<br>2. Defective humidity sensor.<br>3. Defective DPC.<br>(See trouble 4) | |
| Heater turns on when microwave cooking<br>In this case, this trouble should be causing fuse and/or home circuit breaker to open. | 1. Faulty power relay C(RY4)<br>2. Defective D.P.C. | |
| Heater does not turn on. | 1. Defective heater<br>2. Faulty power relay C(RY4)<br>3. Defective D.P.C. (See trouble 4) | |

| CONDITIONS | POSSIBLE CAUSE | NOTE |
|---|---|---|
| "FF FF" appeares in display window after 2 minutes elapsed in the bake, broil, combination or convection cooking mode | 1. Short or open oven temp sensor<br>2. Defective D.P.C. | |

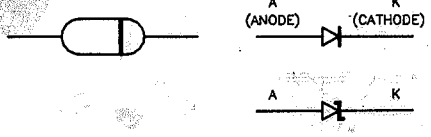
## [TROUBLE 4] Trouble related to Digital programmer circuit

| SYMPTOM | STEP | CHECK | RESULT | CAUSE/CORRECTIONS |
|---|---|---|---|---|
| No display when oven is first plugged in | 1 | Low voltage transformer (L.V.T.) secondary voltage | Abnormal (0V) | L.V.T. |
| | | | Normal | → STEP 2 |
| | 2 | IC-1 pin 64 voltage (Emitter of Q1) | Abnormal | ZD1,Q1 |
| | | | Normal (5V) | → STEP 3 |
| | 3 | IC-1 pin 27 voltage (14 pin of IC-2) | Abnormal | IC-2 |
| | | | Normal (Approx. 5V) | IC-1, CX1, DISPLAY |
| No key input | 1 | Membrane switch continuity | Abnormal | Membrane switch |
| | | | Normal | IC-1 |
| No beep sound | 1 | IC-1 pin 23 voltage | Abnormal | IC-1 |
| | | | Normal | → STEP 2 |
| | 2 | IC-3 pin 13 voltage | Abnormal | IC-3 |
| | | | Normal | BZ |
| Heater does not turn on | 1 | IC-1 pin 19 voltage (at operation) | Abnormal | IC-1 |
| | | | Normal | → STEP 2 |
| | 2 | IC-3 pin 12 voltage (at operation) | Abnormal | IC-3 |
| | | | Normal | → STEP 3 |
| | 3 | Q5 transistor | Abnormal | Q5 |
| | | | Normal | IC-2, RY-4 |
| No microwave oscillation at any power setting | 1 | IC-1 pin 20 and 21 voltages (at High power operation) | Abnormal | IC-1 |
| | | | Normal | → STEP 2 |
| | 2 | Q6 transistor | Abnormal | Q6 |
| | | | Normal | IC-2, RY-2 |
| Dark or unclear display | 1 | Replace DISP and check operation | Abnormal | IC-1 |
| | | | Normal | DISP |
| Missing or lighting of unnecessary segment | 1 | Replace IC-1 and check operation | Abnormal | DISP |
| | | | Normal | IC-1 |

| TO BE CONTINUED FOR AUTO SENSOR MODELS | | | | |
|---|---|---|---|---|
| SYMPTOM | STEP | CHECK | RESULT | CAUSE/CORRECTIONS |
| Oven stops it's operation 30 seconds after the start pad is tapped.<br>Humidity sensor heater stay red glows for 30 sec. | 1 | Short circuit across the sensor terminals and check the operation | Oven operates continuously until cancel pad is tapped. Heater shut off by itself | Humidity sensor |
| | | | Still oven stops operation at 30 seconds. | C6, Q3, IC-1 |
| Humidity sensor heater does not heat up at all | 1 | Heater terminals voltage | Normal AC 5-10V | Humidity sensor heater open |
| | | | No voltage | → STEP 2 |
| | 2 | LVT voltage between S1 and S2 | No voltage | LVT |
| | | | Normal AC 10~20V | D20 triac,IC-1, Q20 |

## HOW TO CHECK THE SEMICONDUCTORS USING AN OHM METER

**Diode**



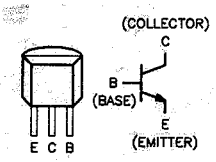

| | FORWARD | REVERSE |
|---|---|---|
| A-K | SMALL | ∞ |

**Transistor**

NPN Transistor

2SC·····

2SD·····

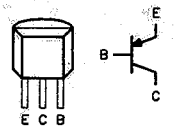



| | FORWARD | REVERSE |
|---|---|---|
| B-E | SMALL | ∞ |
| B-C | SMALL | ∞ |
| C-E | ∞ | ∞ |

PNP Transistor

2SA·····

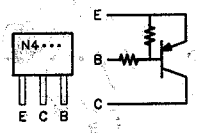
2SB·····




| | FORWARD | REVERSE |
|---|---|---|
| E-B | SMALL | ∞ |
| C-B | SMALL | ∞ |
| C-E | ∞ | ∞ |

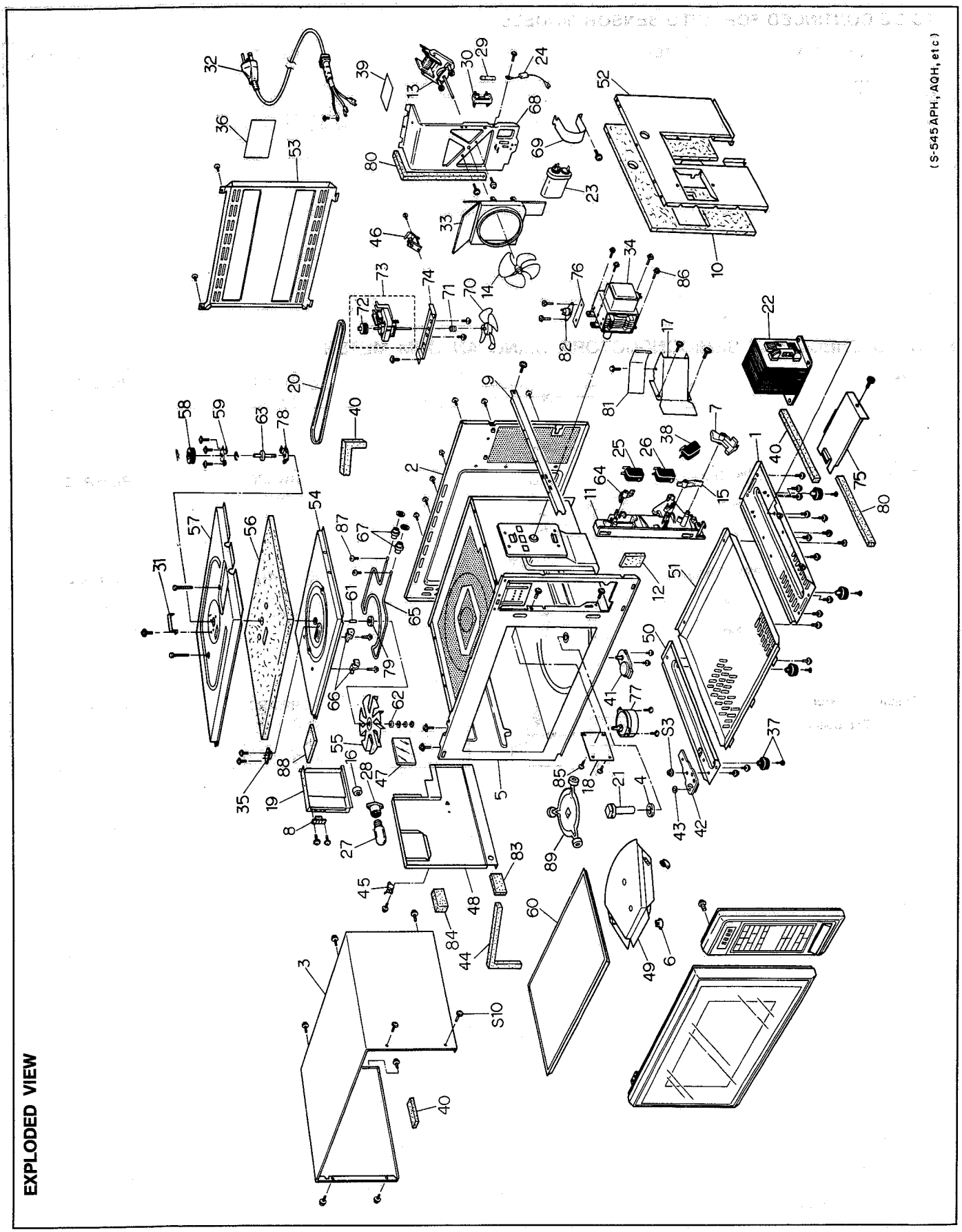
**Digital Transistor**

**PNP Transistor**

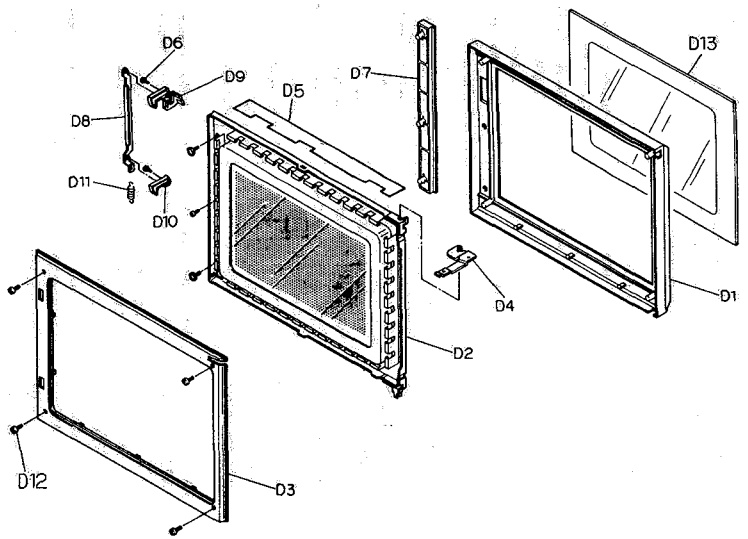



| | FORWARD | REVERSE |
|---|---|---|
| E-B | 10kΩ~30kΩ | 10kΩ~30kΩ |
| C-B | 50kΩ~90kΩ | ∞ |
| C-E | 40kΩ~80kΩ | ∞ |

# EXPLODED VIEW AND PARTS LIST

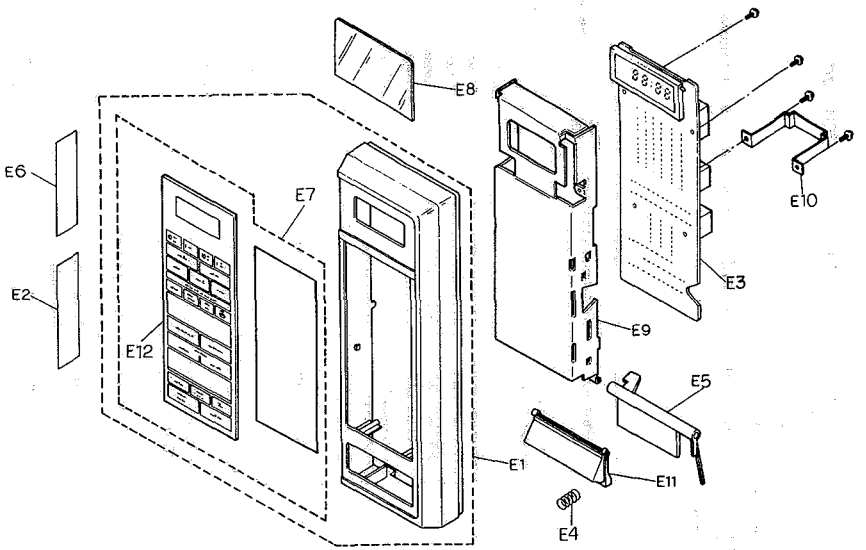


## DOOR ASSEMBLY



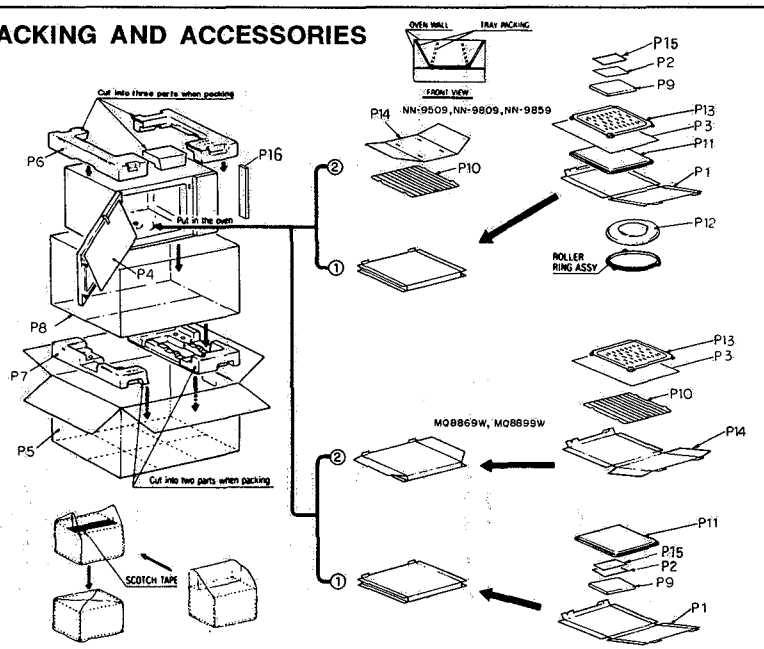

(S-545APH, AQH, etc)

## ESCUTCHEON BASE ASSEMBLY



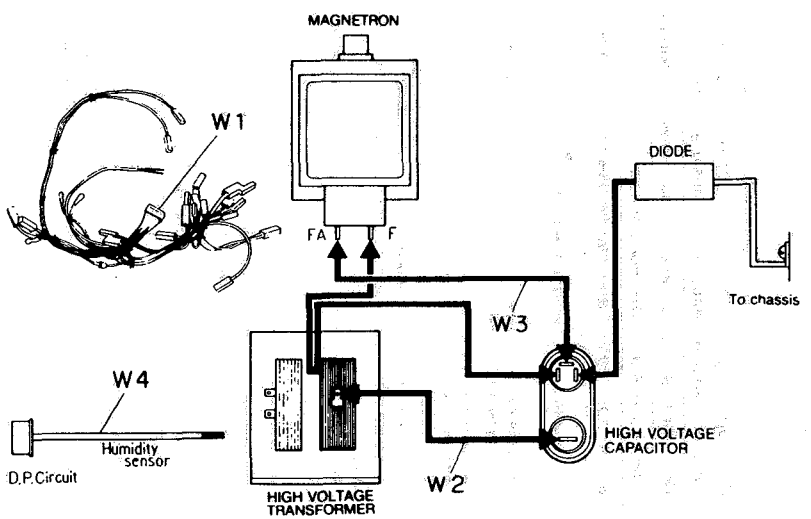

(S-545APH, AQH, etc)

## PACKING AND ACCESSORIES




(S-545APH, AQH, etc)

## WIRING MATERIAL




(S-545 APH, AQH, etc)

## PARTS LIST

NOTE 1: When ordering replacement part(s), please use part number(s) shown in this parts list. Do not use description of the part.

2: Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use only manufacturer's specified parts.

3: Alphabet marks in Remarks columns (i.e. APH, AQH, etc) indicate parts applicable to only specified country models as follows

**APH: For U.S.A. and some of Latin America countries, CPH: For Canada**

**AQH: For U.S.A., CQH: For Canada**

Parts without these marks can be used for all models.

| Ref. No. | | Part No. | Part Name & Description | Pcs/ Set | Remarks |
|---|---|---|---|---|---|
| 1-1 | | A10015450AP | Base | 1 | NN-9509, NN-9809, NN-9859 |
| 1-2 | | A10014250AP | Base | 1 | MQ8869W, MQ8899W |
| 2-1 | | A10045450AP | Back panel | 1 | NN-9509, NN-9809, NN-9859 |
| 2-2 | | A10044250AP | Back panel | 1 | MQ8869W, MQ8899W |
| 3-1 | | A10095450AP | Cabinet body | 1 | NN-9509, NN-9809 |
| 3-2 | | A10095460HAP | Cabinet body | 1 | NN-9859 |
| 3-3 | | A10094250AP | Cabinet body assy | 1 | MQ8869W, MQ8899W |
| 4 | | ANE2177-F80 | Washer | 1 | NN-9509, NN-9809, NN-9859 |
| 5-1 | ⚠ | A200A5450AP | Oven | 1 | NN-9509, NN-9809, NN-9859 |
| 5-2 | ⚠ | A200A5450AQ | Oven | 1 | MQ8869W, MQ8899W |
| 6 | | A20194210AQ | Stirrer stopper | 2 | MQ8869W, MQ8899W |
| 7-1 | | A31374650AP | Hook spacer B | 1 | NN-9509, NN-9809, NN-9859 |
| 7-2 | | ANE31372Q0AP | Hook spacer B | 1 | MQ8869W, MQ8899W |
| 8 | | A601L4780AP | Humidity sensor | 1 | NN-9809, NN-9859, MQ8899W |
| 9 | | A20365450AP | Reinforce bracket B | 1 | |
| 10 | | A22434250AP | Adiabatic material B | 1 | MQ8869W, MQ8899W |
| 11-1 | ⚠ | A30204310AG | Door hook A | 1 | NN-9509, NN-9809, NN-9859 |
| 11-2 | ⚠ | ANE30207J0AP | Door hook A | 1 | MQ8869W, MQ8899W |
| 12 | | ANE0901000CD | Cushion rubber A | 1 | MQ8869W, MQ8899W |
| 13-1 | | A400A4010AP | Fan motor | 1 | NN-9509, NN-9809, NN-9859 AC, 24W, Single |
| 13-2 | | A400A4210AP | Fan motor | 1 | MQ8869W, MQ8899W AC, 24W, Single |
| 14 | | ANE40086W0AP | Fan | 1 | |
| 15-1 | | A31384650AP | Hook spacer C | 1 | NN-9509, NN-9809, NN-9859 |
| 15-2 | | ANE31382Q0AP | Hook spacer C | 1 | MQ8869W, MQ8899W |
| 16 | | ANE6075X70AP | Spacer | 1 | NN-9509, NN-9809, NN-9859 |
| 17-1 | | A40255450AP | Air guide A | 1 | NN-9509, NN-9809, NN-9859 |
| 17-2 | | A40254250AP | Air guide A | 1 | MQ8869W, MQ8899W |
| 18 | | A20555450AP | Cover A | 1 | NN-9509, NN-9809, NN-9859 |
| 19-1 | | A400K5020AQ | Exhaust guide | 1 | NN-9509 |
| 19-2 | | A400K5040AQ | Exhaust guide | 1 | NN-9809, NN-9859 |
| 19-3 | | A400K4250AP | Exhaust guide | 1 | MQ8869W |
| 19-4 | | A400K4260AP | Exhaust guide | 1 | MQ8899W |
| 20-1 | | A41555450AP | Belt C | 1 | NN-9509, NN-9809, NN-9859 (Si) |
| 20-2 | | A41554250AP | Belt C | 1 | MQ8869W, MQ8899W (Si) |
| 21 | | A21315450AP | Pulley shaft | 1 | NN-9509, NN-9809, NN-9859 |
| 22-1 | ⚠ | A600B5180AP | H.V.Transformer | 1 | NN-9509, NN-9809, NN-9859 (1.4KVA) |
| 22-2 | ⚠ | A600B4210AP | H.V.Transformer | 1 | MQ8869W, MQ8899W (1.4KVA) |
| 23-1 | ⚠ | A60904650AP | H.V.Capacitor | 1 | NN-9509, NN-9809, NN-9859 (0.951μF, AC2000V) |
| 23-2 | ⚠ | A60904010AP | H.V.Capacitor | 1 | MQ8869W, MQ8899W (0.935μF, AC2000V) |
| 24 | ⚠ | A62024000AP | Diode | 1 | (Si, 0.35mA) |
| 25-1, 26-1 | ⚠ | ANE61424L0AG | Micro switch | 2 | Primary/Secondary latch switch (V-16G-3C26) MQ8869W, MQ8899W |
| 25-2 | ⚠ | ANE61424L0AG | Micro switch | 1 | Primary latch switch (V-16G-3C26) NN-9509, NN-9809, NN-9859 |
| 26-2 | ⚠ | A61424650AP | Micro switch | 1 | Secondary latch switch NN-9509, NN-9809, NN-9859 (L-3C2-MR) |
| 27 | | ANE6030540AP | Incandescent lamp | 1 | (125V, 20W) |
| 28 | | A61524210AA | Oven lamp socket | 1 | |
| 29 | ⚠ | ANE6230B00AP | Fuse | 1 | (125V, 15A) |
| 30 | | A62314000AP | Fuse holder | 1 | |

| Ref. No. | | Part No. | Part Name & Description | Pcs/ Set | Remarks |
|---|---|---|---|---|---|
| 31 | | A12074250AP | Reinforce bracket | 1 | MQ8869W, MQ8899W |
| 32-1 | | A900C5020AP | AC cord W/plug | 1 | NN-9509, NN-9809, NN-9859 APH (125V) |
| 32-2 | | A900C5020CQ | AC cord W/plug | 1 | NN-9859 CPH (125V) |
| 32-3 | | A900C4250AP | AC cord W/plug | 1 | MQ8869W, MQ8899W AQH (125V) |
| 32-4 | | A900C4250CP | AC cord W/plug | 1 | MQ8899W CQH (125V) |
| 33-1 | | A41445020AP | Orifice | 1 | NN-9509, NN-9809, NN-9859 |
| 33-2 | | A41444250AP | Orifice | 1 | MQ8869W, MQ8899W |
| 34 | ⚠ | 2M210-M1C | Magnetron | 1 | |
| 35 | | A605Y4210AQ | Oven temp sensor | 1 | |
| 36-1 | | A00064650AP | Warning label | 1 | NN-9509, NN-9809, NN-9859 APH, MQ8869W, MQ8899W AQH |
| 36-2 | | ANE0006R30CP | Warning label | 1 | NN-9859 CPH, MQ8899W CQH |
| 37 | | ANE1008-3WO | Rubber foot | 4 | |
| 38-1 | ⚠ | ANE6178-5R0 | Micro switch | 1 | NN-9509, NN-9809, NN-9859 Short switch (L-2C2-MR) |
| 38-2 | ⚠ | ANE61784L0AG | Micro switch | 1 | MQ8869W, MQ8899W Short switch (V-16G-2C25) |
| 39-1 | | A00335020AP | Fuse label | 1 | NN-9509, NN-9809, NN-9859 |
| 39-2 | | A00335450AQ | Fuse label | 1 | MQ8869W, MQ8899W AQH |
| 39-3 | | A00334210AP | Fuse label | 1 | MQ8899W CQH |
| 40 | | ANE000Z000AA | Cushion rubber | 3 | MQ8869W, MQ8899W |
| 41 | | A61444000AQ | Antenna motor | 1 | MQ8869W, MQ8899W (AC, 2W, Single) |
| 42-1 | ⚠ | A30075450AP | Lower hinge | 1 | NN-9509, NN-9809, NN-9859 |
| 42-2 | ⚠ | A301L4210AP | Lower hinge | 1 | MQ8869W, MQ8899W |
| 43 | | ANE3081B60AP | Door hinge spacer | 1 | MQ8869W, MQ8899W |
| 44 | | ANE0929000AJ | Cushion rubber C | 1 | MQ8869W, MQ8899W |
| 45 | | A61454210AP | Thermal cutout | 1 | |
| 46 | | ANE11408A0AG | Stopper A | 1 | |
| 47 | | A64374250AP | Glass plate | 1 | MQ8869W, MQ8899W (For oven lamp) |
| 48 | | A22374250AP | Left heater panel | 1 | MQ8869W, MQ8899W |
| 49 | | A202K4250AQ | Antenna | 1 | MQ8869W, MQ8899W (Moving antenna) |
| 50-1 | | A11295450AP | Base B | 1 | NN-9509, NN-9809, NN-9859 |
| 50-2 | | A11294250AP | Base B | 1 | MQ8869W, MQ8899W |
| 51-1 | | A10265450AP | Base C | 1 | NN-9509, NN-9809, NN-9859 |
| 51-2 | | A10264250AP | Base C | 1 | MQ8869W, MQ8899W |
| 52-1 | | A22365450AP | Right heater panel | 1 | NN-9509, NN-9809, NN-9859 |
| 52-2 | | A22364250AQ | Right heater panel | 1 | MQ8869W, MQ8899W |
| 53-1 | | A10585450AP | Back panel cover A | 1 | NN-9509, NN-9809, NN-9859 |
| 53-2 | | A10584250AP | Back panel cover A | 1 | MQ8869W, MQ8899W |
| 54-1 | | A21445450AP | Upper panel B | 1 | NN-9509, NN-9809, NN-9859 |
| 54-2 | | A203L4250AP | Upper panel B | 1 | MQ8869W, MQ8899W |
| 55-1 | | ANE22392L0AP | Circulation fan | 1 | NN-9509, NN-9809, NN-9859 |
| 55-2 | | A22394250AP | Circulation fan | 1 | MQ8869W, MQ8899W |
| 56-1 | | A22425450AP | Adiabatic material A | 1 | NN-9509, NN-9809, NN-9859 |
| 56-2 | | A22424250AP | Adiabatic material A | 1 | MQ8869W, MQ8899W |
| 57-1 | | A22785450AP | Upper heater panel | 1 | NN-9509, NN-9809, NN-9859 |
| 57-2 | | A22784250AP | Upper heater panel | 1 | MQ8869W, MQ8899W |
| 58-1 | | A41325020AQ | Pulley B | 1 | NN-9509, NN-9809, NN-9859 |
| 58-2 | | ANE41322L0AP | Pulley B | 1 | MQ8869W, MQ8899W |
| 59-1 | | A41575450AP | Fan bracket A | 1 | NN-9509, NN-9809, NN-9859 |
| 59-2 | | A41574250AP | Fan bracket A | 1 | MQ8869W, MQ8899W |
| 60 | | A010T4250AQ | Shelf | 1 | MQ8869W, MQ8899W |
| 61 | | A41614210AQ | Spacer A | 1 | MQ8869W, MQ8899W |

(S-545 APH)

| Ref. No. | | Part No. | Part Name & Description | Pcs/ Set | Remarks |
|---|---|---|---|---|---|
| 62 | | ANE41622L0AP | Spacer B | 1 | MQ8869W, MQ8899W |
| 63-1 | | A41645450AP | Shaft assy | 1 | NN-9509, NN-9809, NN-9859 |
| 63-2 | | A41644210AQ | Shaft assy | 1 | MQ8869W, MQ8899W |
| 64 | | ANE31362Q0AP | Hook spacer A | 1 | MQ8869W, MQ8899W |
| 65-1 | | ANE630G2L0CP | Heater A | 1 | NN-9509, NN-9809, NN-9859 |
| 65-2 | | A630G4210AQ | Heater A | 1 | MQ8869W, MQ8899W |
| 66-1 | | A64175130AP | Heater support | 2 | NN-9509, NN-9809, NN-9859 |
| 66-2 | | A64174210AQ | Heater support | 2 | MQ8869W, MQ8899W |
| 67 | | ANE6501K90AP | Holder C | 2 | |
| 68 | | A41124250AP | Fan motor bracket B | 1 | MQ8869W, MQ8899W |
| 69-1 | | A61884060AP | Capacitor bracket | 1 | NN-9509, NN-9809, NN-9859 |
| 69-2 | | ANE6037X00AP | Capacitor bracket | 1 | MQ8869W, MQ8899W |
| 70-1 | | A40085020AQ | Fan | 1 | NN-9509, NN-9809, NN-9859 |
| 70-2 | | ANE40082L0AP | Fan | 1 | MQ8869W, MQ8899W |
| 71 | | ANE4057-F50 | Spring | 1 | MQ8869W, MQ8899W |
| 72 | | ANE41312L0AP | Pulley A | 1 | MQ8869W, MQ8899W |
| 73-1 | | A41795450AP | Heater fan motor assy | 1 | NN-9509, NN-9809, NN-9859 |
| 73-2 | | A41794210AP | Heater fan motor assy | 1 | MQ8869W, MQ8899W |
| 74-1 | | A41805450AP | Bracket | 1 | NN-9509, NN-9809, NN-9859 |
| 74-2 | | A41804250AP | Bracket | 1 | MQ8869W, MQ8899W |
| 75 | | A11264210CP | Base metal | 1 | MQ8899W CQH |
| 76 | | A62384310AG | Spacer | 1 | MQ8869W, MQ8899W |
| 77 | | A63265450AP | Turntable motor | 1 | NN-9509, NN-9809, NN-9859 |
| 78-1 | | A41585450AP | Fan bracket B | 1 | NN-9509, NN-9809, NN-9859 |
| 78-2 | | A41584210AQ | Fan bracket B | 1 | MQ8869W, MQ8899W |
| 79-1 | | A41635020AQ | Spacer C | 1 | NN-9509, NN-9809, NN-9859 |
| 79-2 | | A41634250AP | Spacer C | 1 | MQ8869W, MQ8899W |
| 80 | | ANE000Z000AB | Cushion rubber C | 2 | NN-9509, NN-9809, NN-9859 |
| 81 | | A40264250AP | Air guide B | 1 | MQ8869W, MQ8899W |
| 82 | | A61454000AP | Thermal cutout | 1 | MQ8869W, MQ8899W |
| 83 | | ANE0902000DB | Cushion rubber A | 1 | MQ8869W, MQ8899W |
| 84 | | ANE0924000DE | Cushion rubber C | 1 | MQ8869W, MQ8899W |
| 85 | | XST4+5VS | Screw 4×5 | 1 | |
| 86 | | XTWANE4+10RU | Tapping screw 4×10 | 4 | |
| 87 | | XYT4+C8VS | Screw 4×8 | 2 | |
| 88 | | A41034210AQ | Air guide cushion B | 1 | MQ8869W, MQ8899W89 |
| 89 | | A200P5450AP | Metal turntable | 1 | NN-9509, NN-9809, NN-9859 |

## DOOR ASSEMBLY

| | | | | | |
|---|---|---|---|---|---|
| D1-1 | ⚠ | A302A5450AP | Door A assy | 1 | NN-9509, NN-9809 |
| D1-2 | ⚠ | A302A5460HAP | Door A assy | 1 | NN-9859 |
| D1-3 | ⚠ | A30014250AQ | Door A assy | 1 | MQ8869W, MQ8899W |
| D2-1 | ⚠ | A302K5450AP | Door E assy | 1 | NN-9509, NN-9809, NN-9859 |
| D2-2 | ⚠ | A302K4250AP | Door E assy | 1 | MQ8869W, MQ8899W |
| D3-1 | ⚠ | A30855450AP | Door C | 1 | NN-9509, NN-9809 |
| D3-2 | ⚠ | A30855460HAP | Door C | 1 | NN-9859 |
| D3-3 | ⚠ | A30854250AP | Door C | 1 | MQ8869W, MQ8899W |
| D4-1 | ⚠ | A300B5450AP | Upper hinge | 1 | NN-9509, NN-9809, NN-9859 |
| D4-2 | ⚠ | A300B4210AP | Upper hinge | 1 | MQ8869W, MQ8899W |
| D5 | | A30884250AP | Ferrite rubber | 1 | MQ8869W, MQ8899W |
| D6 | | ANE30567J0AP | Door key pin | 2 | MQ8869W, MQ8899W |
| D7 | | A30124250AQ | Door handle | 1 | MQ8869W, MQ8899W |
| D8 | | A301H4210AP | Door key lever B | 1 | MQ8869W, MQ8899W |
| D9-1 | | A30184650AP | Door key A | 1 | NN-9509, NN-9809, NN-9859 |
| D9-2 | | ANE30182Q0AP | Door key A | 1 | MQ8869W, MQ8899W |
| D10 | | ANE30192Q0AP | Door key B | 1 | MQ8869W, MQ8899W |
| D11-1 | | A30214000AP | Door key spring | 1 | NN-9509, NN-9809, NN-9859 |
| D11-2 | | ANE3021X00AP | Door key spring | 1 | MQ8869W, MQ8899W |
| D12-1 | | XTBANE4+12FK | Tapping screw 4×12 | 4 | NN-9509, NN-9809, MQ8869W, MQ8899W |
| D12-2 | | XTBANE4+12FC | Tapping screw 4×12 | 4 | NN-9859 |
| D13 | | A31465450AQ | Door screen B assy | 1 | MQ8869W, MQ8899W |

| Ref. No. | | Part No. | Part Name & Description | Pcs/ Set | Remarks |
|---|---|---|---|---|---|

## ESCUTCHEON BASE ASSEMBLY

| | | | | | |
|---|---|---|---|---|---|
| E1-1 | | A800L5450AP | Escutcheon base assy | 1 | NN-9509 (NOTE 4) (With Membrane switch assy) |
| E1-2 | | A800L5460AP | Escutcheon base assy | 1 | NN-9809 (NOTE 4) (With Membrane switch assy) |
| E1-3 | | A800L5460HAP | Escutcheon base assy | 1 | NN-9859 (NOTE 4) (With Membrane switch assy) |
| E1-4 | | A80344250AQ | Escutcheon base | 1 | MQ8869W, MQ8899W (NOTE 4) |
| E2-1 | | A01575450AP | Name plate | 1 | NN-9509 |
| E2-2 | | A01575460AP | Name plate | 1 | NN-9809 |
| E2-3 | | A01575460HAP | Name plate | 1 | NN-9859 APH |
| E2-4 | | A01575450AQ | Name plate | 1 | MQ8869W |
| E2-5 | | A01575460AQ | Name plate | 1 | MQ8899W AQH |
| E3-1 | | A603L5450AP | D.P.Circuit assy | 1 | NN-9509 (W/Component) |
| E3-2 | | A603L5460AP | D.P.Circuit assy | 1 | NN-9809, NN-9859 (W/Component) |
| E3-3 | | A603L5450AQ | D.P.Circuit assy | 1 | MQ8869W(W/Component) |
| E3-4 | | A603L5460AQ | D.P.Circuit assy | 1 | MQ8899W(W/Component) |
| E4 | | ANE80378A0AG | Spring | 1 | NN-9509, NN-9809, NN-9859 |
| E5-1 | | A82565110BP | Door opening lever | 1 | NN-9509, NN-9809, NN-9859 |
| E5-2 | | A82564210AP | Door opening lever | 1 | MQ8869W, MQ8899W |
| E6-1 | | ANE0245X00AP | DHHS label | 1 | NN-9509, NN-9809, NN-9859 APH MQ8869W, MQ8899W AQH |
| E6-2 | | A04115020CQ | CSA caution label | 1 | NN-9859 CPH MQ8899W CQH |
| E7-1 | | A630Y5450AP | Membrane switch assy | 1 | NN-9509 (With Escutcheon sheet) |
| E7-2 | | A630Y5460AP | Membrane switch assy | 1 | NN-9809 (With Escutcheon sheet) |
| E7-3 | | A630Y5460HAP | Membrane switchassy | 1 | NN-9859 (With Escutcheon sheet) |
| E7-4 | | A64795450AQ | Membrane switch | 1 | MQ8869W |
| E7-5 | | A64795460AQ | Membrane switch | 1 | MQ8899W |
| E8 | | A81264250AQ | Smoke panel | 1 | MQ8869W, MQ8899W |
| E9-1 | | A81275450AP | Bracket | 1 | NN-9509, NN-9809, NN-9859 |
| E9-2 | | A81274210AQ | Bracket | 1 | MQ8869W, MQ8899W |
| E10-1 | | A65514210AQ | L.V.T.Support bracket | 1 | MQ8869W |
| E10-2 | | ANE6551R20AP | L.V.T.Support bracket | 1 | MQ8899W |
| E11-1 | | A80725110BP | Door opening button | 1 | NN-9509, NN-9809 |
| E11-2 | | A80725090HAQ | Door opening button | 1 | NN-9859 |
| E11-3 | | A80724210AP | Door opening button | 1 | MQ8869W, MQ8899W |
| E12-1 | | A83375450AP | Escutcheon sheet | 1 | NN-9509 |
| E12-2 | | A83375460AP | Escutcheon sheet | 1 | NN-9809 |
| E12-3 | | A83375460HAP | Escutcheon sheet | 1 | NN-9859 |

## PACKING AND ACCESSORIES

| | | | | | |
|---|---|---|---|---|---|
| P1-1 | | A01175460CP | Packing B | 1 | NN-9859 |
| P1-2 | | A01174250AQ | Packing B | 1 | MQ8899W CQH |
| P2-1 | | A00035450AP | Instruction book | 1 | NN-9509, NN-9809, NN-9859 APH |
| P2-2 | | A00035460CP | Instruction book | 1 | NN-9859 CPH |
| P2-3 | | A00035450AQ | Instruction book | 1 | MQ8869W, MQ8899W AQH |
| P2-4 | | A00035450CQ | Instruction book | 1 | MQ8899W CQH |
| P3-1 | | A02075450AP | Styrol sheet | 1 | NN-9509, NN-9809, NN-9859 |
| P3-2 | | ANE02072L0AP | Styrol sheet | 1 | MQ8899W CQH |
| P4 | | ANE0107580AP | Door sheet | 1 | |
| P5-1 | | A01025450AP | Packing case, paper | 1 | NN-9509 |
| P5-2 | | A01025460AP | Packing case, paper | 1 | NN-9809 |
| P5-3 | | A01025460HAP | Packing case, paper | 1 | NN-9859 APH |
| P5-4 | | A01025460HCP | Packing case, paper | 1 | NN-9859 CPH |
| P5-5 | | A01025450AQ | Packing case, paper | 1 | MQ8869W |
| P5-6 | | A01025460AQ | Packing case, paper | 1 | MQ8899W AQH |
| P5-7 | | A01025460CQ | Packing case, paper | 1 | MQ8899W CQH |
| P6-1 | | A01045450AP | Upper filler | 1 | NN-9509, NN-9809, NN-9859 |
| P6-2 | | A01044250AP | Upper filler | 1 | MQ8869W, MQ8899W |

(S-545 APH)

| Ref. No. | | Part No. | Part Name & Description | Pcs/ Set | Remarks |
|---|---|---|---|---|---|
| P7-1 | | A01054210AP | Lower filler | 1 | NN-9509, NN-9809, NN-9859 |
| P7-2 | | A01054250AP | Lower filler | 1 | MQ8869W, MQ8899W |
| P8-1 | | A01065200AP | Vinyl cover | 1 | NN-9509, NN-9809, NN-9859 |
| P8-2 | | A01065130AP | Vinyl cover | 1 | MQ8869W, MQ8899W |
| P9-1 | | A000B5130AP | Cook book | 1 | NN-9509, NN-9809, NN-9859 APH |
| P9-2 | | A000B5130CP | Cook book | 1 | NN-9859 CPH |
| P9-3 | | A000B5140AQ | Cook book | 1 | MQ8869W, MQ8899W AQH |
| P9-4 | | A000B5140CQ | Cook book | 1 | MQ8899W CQH |
| P10-1 | | A06025450AP | Oven rack | 1 | NN-9509, NN-9809, NN-9859 |
| P10-2 | | A06025450AQ | Oven rack | 1 | MQ8869W, MQ8899W |
| P11 | | A06034250AP | Broiler pan | 1 | NN-9859,MQ8899W CQH |
| P12 | | A06015450AP | Metal tray | 1 | NN-9509, NN-9809, NN-9859 |
| P13 | | A06484250AP | Spatter shield | 1 | NN-9859,MQ8899W CQH |
| P14-1 | | A01085450AP | Tray packing | 1 | NN-9509, NN-9809 |
| P14-2 | | A01085460CP | Tray packing | 1 | NN-9859 |
| P14-3 | | A01084250AG | Tray packing | 1 | MQ8869W, MQ8899W AQH |
| P14-4 | | A01084250AQ | Tray packing | 1 | MQ8899W CQH |
| P15 | | ANE0169B60CP | Servicenter list | 1 | NN-9859 CPH,MQ8899W CQH |
| P16 | | A01454250AP | Door sheet B | 1 | MQ8869W, MQ8899W |
| **WIRING MATERIAL** | | | | | |
| W1-1 | | A030A5450AP | Lead wire harness | 1 | NN-9509, NN-9809, NN-9859 APH |
| W1-2 | | A030A5460CP | Lead wire harness | 1 | NN-9859 CPH |
| W1-3 | | A030A5450AQ | Lead wire harness | 1 | MQ8869W, MQ8899W AQH |
| W1-4 | | A030A5460CQ | Lead wire harness | 1 | MQ8899W CQH |
| W2 | | A03504000AP | Lead wire | 1 | |
| W3-1 | | A03514000AP | Lead wire | 1 | NN-9509, NN-9809, NN-9859 (NOTE 5) |
| W3-2 | | A03504210AP | Lead wire | 1 | MQ8869W, MQ8899W (NOTE 5) |
| W4 | | A03535040AP | Lead wire | 1 | NN-9809, NN-9859, MQ8899W |

NOTE 4: Please order name plate and either DHHS label or CSA caution label together.
5: When this lead wire is open, replace together with magnetron.

# DIGITAL PROGRAMMER CIRCUIT

## PARTS LIST (NN-9509, NN-9809, NN-9859, MQ8869W, MQ8899W)

| Ref. No. | Part No. | Description | Pcs/ Set | Remarks |
|---|---|---|---|---|
| DISP | A64565040AP | Fluorescent tube | 1 | |
| SPACER | A82844210AP | Spacer cushion | 1 | For DISP |
| T1 | A62495020AQ | L.V.Transformer | 1 | NN-9509 (4.5VA) |
| T1 | A62495040AP | L.V.Transformer | 1 | NN-9809, NN-9859 (12VA) |
| T1 | A62494210AQ | L.V.Transformer | 1 | MQ8869W (5.1VA) |
| T1 | A62495460AQ | L.V.Transformer | 1 | MQ8899W |
| CN1 | AEEMMA15509W | 9 pin connector | 1 | |
| CN2,3 | AEEMMC00F04W | 4 pin connector | 2 | |
| CN4 | AEEM11FDZBTM | 11 pin connector | 1 | NN-9509, NN-9809, NN-9859 |
| CN4 | AEEMWD1012 | 12 pin connector | 1 | MQ8869W, MQ8899W |
| CN5 | AEEMMA07507W | 7 pin connector | 1 | NN-9809, NN-9859, MQ8899W |
| BZ | AEFB22EP2002 | Buzzer | 1 | 2kHz |
| CX1 | AEFFT4R19GW | Ceramic resonator | 1 | 4.19MHz |
| RY1 | AEAWJZDC18A | Power relay | 1 | (18V) |
| RY2,4 | AEBG5J12TA1 | Power relay | 2 | (12V) |
| RY5 | AEBVG-18P-0 | Power relay | 1 | (18V) |
| ZNR | ERZC10DK471F | ZNR | 1 | |
| IC1 | AEIC50940172 | L.S.I. (MOS Microprocessor IC) | 1 | NN-9509, NN-9809, NN-9859 |
| IC1 | AEIC50940173 | L.S.I. (MOS Microprocessor IC) | 1 | MQ8869W, MQ8899W |
| IC2 | AN6752 | I.C. (Bipolar Linear IC) | 1 | |
| IC3 | AEICBA12004 | I.C. | 1 | |
| Q1 | 2SD2006-RTA | Transistor, Si 250mW | 1 | (120MHz) |
| Q2 | UN4211-(TA) | Transistor, Si 300mW | 1 | NN-9809, NN-9859, MQ8899W |
| Q3 | 2SC1685-RTA | Transistor, Si 250mW | 1 | NN-9809, NN-9859, MQ8899W (150MHz) |
| Q5 | UN4123-(TA) | Transistor, Si | 1 | |
| Q6 | 2SC1318-RTA | Transistor, Si 400mW | 1 | (200MHz) |
| D1,2 | AEDNERA1502 | Diode, Si | 2 | (0.1A) |
| D3,4,6,7,8,9 | MA195-(TA5) | Diode, Si | 6 | NN-9509, MQ8869W (0.1A) |
| D3,4,5,6,7,8,9 | MA195-(TA5) | Diode, Si | 7 | NN-9809, NN-9859, MQ8899W (0.1A) |
| D20 | AESMAC03DGMB | Triac | 1 | NN-9809, NN-9859, MQ8899W |
| ZD1 | AEDZ5R6ES2T1 | Zener diode, Si | 1 | |
| ZD2 | AEDZ4R7ES3T1 | Zener diode, Si | 1 | |
| ZD4 | AEDZ4R3ES3T1 | Zener diode, Si | 1 | NN-9809, NN-9859, MQ8899W |
| ZD5 | AEDZ15ES3T1 | Zener diode, Si | 1 | |
| C1 | ECEA1VU102E | Electrolytic capacitor, Al | 1 | 1000μF, −10%+30%, 35V |
| C2 | ECEA1VU221B | Electrolytic capacitor, Al | 1 | 220μF, −10%+30%, 35V |
| C3 | ECEA1CU220B | Electrolytic capacitor, Al | 1 | 22μF, −10%+30%, 16V |
| C5 | ECEA1HU010B | Electrolytic capacitor, Al | 1 | NN-9809, NN-9859, MQ8899W 1μF, −10%+30%, 50V |
| C6 | ECEA1HUR47B | Electrolytic capacitor, Al | 1 | NN-9809, NN-9859, MQ8899W 0.47μF, −10%+30%, 50V |
| C7 | ECBT1H102KB5 | Ceramic capacitor | 1 | NN-9809, NN-9859, MQ8899W (Single layer) 0.001μF, ±10%, 50W |
| C8 | ECKR1H103ZF | Ceramic capacitor | 1 | (Single layer) 0.01μF, −20%+80%, 50V |
| C9,10,11,12,14 | ECBT1E103ZF5 | Ceramic capacitor | 5 | NN-9509, NN-9809, NN-9859 (Single layer) 0.01μF, −20%+80%, 25V |
| C10,11,12,14 | ECBT1E103ZF5 | Ceramic capacitor | 4 | MQ8869W, MQ8899W (Single layer) 0.01μF, −20%+80%, 25V |
| C13 | ECEA1HU4R7B | Electrolytic capacitor, Al | 1 | 0.47μF, −10%+30%, 50V |
| C17 | AECF055F104Z | Ceramic capacitor | 1 | MQ8869W, MQ8899W (Multi layer) 0.1μF, −20%+80%, 50V |
| R1,2 | ERDS2TJ201T | Carbon film resistor | 2 | NN-9509, MQ8869W 200Ω, ±5%, 1/4W |
| R1,2,12,15 | ERDS2TJ201T | Carbon film resistor | 4 | NN-9809, NN-9859, MQ8899W 200Ω, ±5%, 1/4W |
| R3,19,20,21,24,41,43,48,C7, | ERDS2TJ103T | Carbon film resistor | 9 | NN-9509, MQ8869W 10kΩ, ±5%, 1/4W |
| R3,19,20,21,24,41,42,43 | ERDS2TJ103T | Carbon film resistor | 8 | NN-9809, NN-9859, MQ8899W 10kΩ, ±5%, 1/4W |
| R4,5,23,28,29,30,31 | ERDS2TJ751T | Carbon film resistor | 7 | NN-9509, MQ8869W 750Ω, ±5%, 1/4W |
| R4,5,6,7,23,28,29,30,31 | ERDS2TJ751T | Carbon film resistor | 9 | NN-9809, NN-9859, MQ8899W 750Ω, ±5%, 1/4W |
| R17 | EROS2TKF8662 | Metal film resistor | 1 | NN-9809, NN-9859, MQ8899W 86.6kΩ, ±1%, 1/4W |
| R18 | ERDS2TJ914T | Carbon film resistor | 1 | 910kΩ, ±5%, 1/4W |
| R22,27 | ERDS2TJ512T | Carbon film resistor | 2 | NN-9509, MQ8869W 5.1kΩ, ±5%, 1/4W |
| R13,14,22,27 | ERDS2TJ512T | Carbon film resistor | 4 | NN-9809, NN-9859, MQ8899W 5.1kΩ, ±5%, 1/4W |
| R25 | ERDS2TJ105T | Carbon film resistor | 1 | NN-9509, MQ8869W 1MΩ, ±5%, 1/4W |
| R16,25 | ERDS2TJ105T | Carbon film resistor | 2 | NN-9809, NN-9859, MQ8899W 1MΩ, ±5%, 1/4W |
| R26 | ERDS2TJ153T | Carbon film resistor | 1 | 15kΩ, ±5%, 1/4W |
| R34,35 | ERDS2TJ300T | Carbon film resistor | 2 | 30Ω, ±5%, 1/4W |
| R38,39 | ERDS2TJ390T | Carbon film resistor | 2 | NN-9509, NN-9809, NN-9859, MQ8899W 39Ω, ±5%, 1/4W |
| R38,39,49 | ERDS2TJ390T | Carbon film resistor | 3 | MQ8869W 39Ω, ±5%, 1/4W |
| R46 | ERDS2TJ181T | Carbon film resistor | 1 | NN-9509, MQ8869W 180Ω, ±5%, 1/4W |
| R8,9,10,11,46 | ERDS2TJ181T | Carbon film resistor | 5 | NN-9809, NN-9859, MQ8899W 180Ω, ±5%, 1/4W |
| R47 | ERDS2TJ330T | Carbon film resistor | 1 | 33Ω, ±5%, 1/4W |
| Z1 | AEXB04153J | Compound resistor | 1 | 15kΩX4, ±5%, 1/8W |

## SERVICE FIXTURES AND TOOLS

### EXTENSION CABLES

NOTE: To be used when repairing the DPC board assembly directly on the oven for easy access of the board.

| Ref. No. | Part No. | Description | Pcs/ Set | Remarks |
|---|---|---|---|---|
| | AT40M004 | 4 pin extension cable | 1 | Cable No.16 |
| | AT40M009 | 9 pin extension cable | 1 | Cable No.33 |
| | AT40M007 | 7 pin extension cable | 1 | Cable No.37 |
| | AT40E006 | 1 pinX6 extension cable | 1 | Cable No.9 |

### DPC COMMON CHECKER AND ITS CABLE

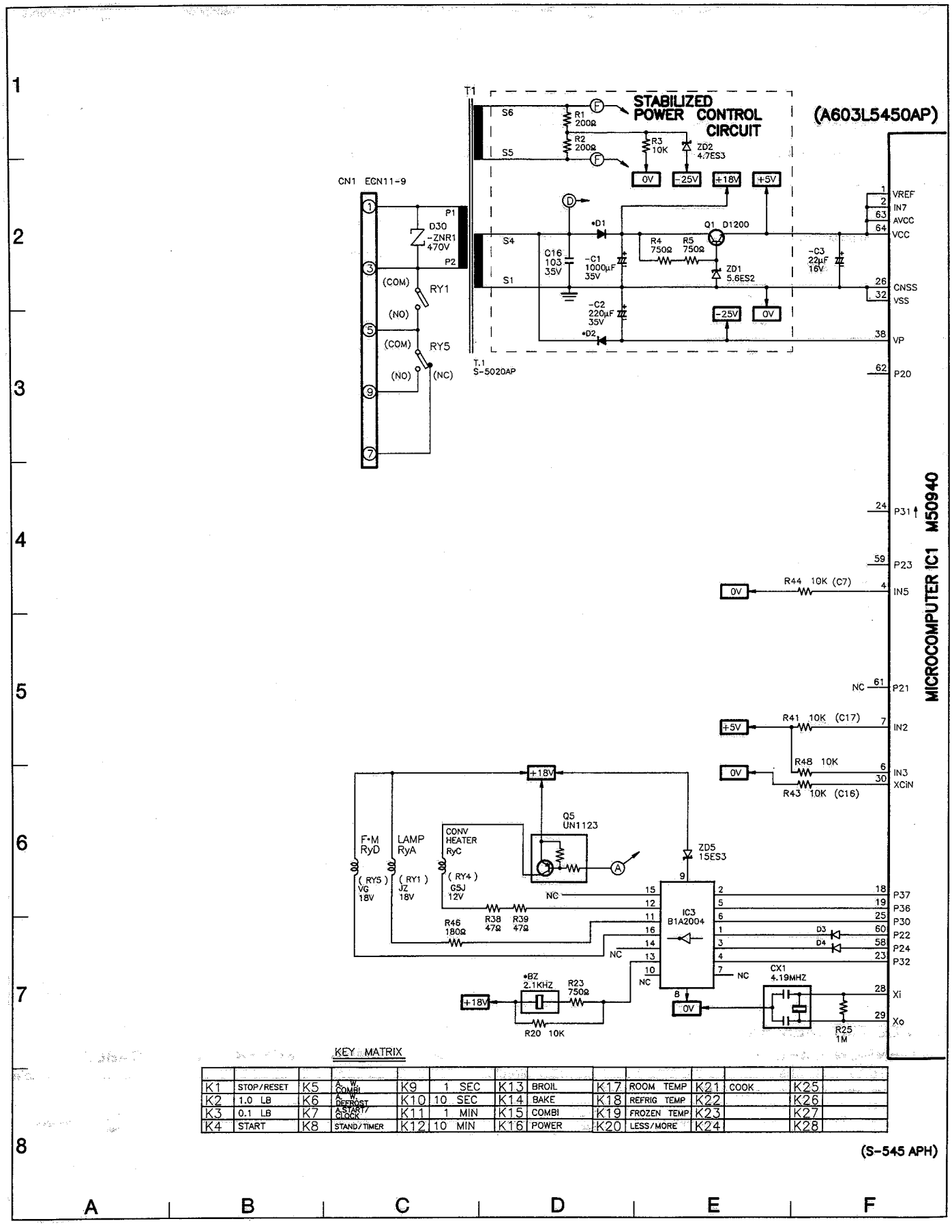
NOTE: To be used only when DPC common checker is available.

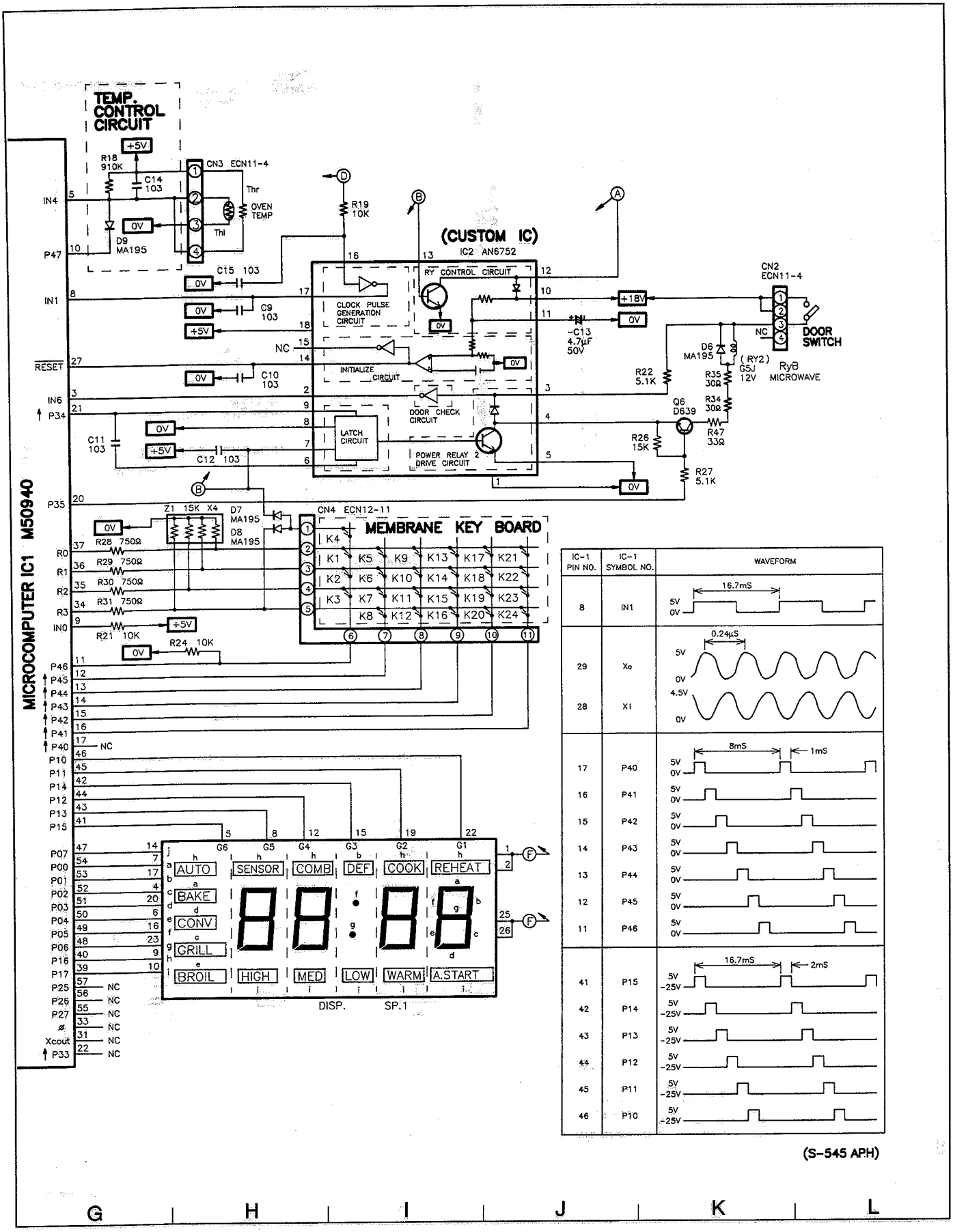
| Ref. No. | Part No. | Description | Pcs/ Set | Remarks |
|---|---|---|---|---|
| | ANE600ZK70AP | DPC common checker | 1 | |
| | AT30A5450AP | DPC checker cable | 1 | NOTE |

(S-545 APH etc.)

# DIGITAL PROGRAMMER CIRCUIT (NN-9509)

## SCHEMATIC DIAGRAM



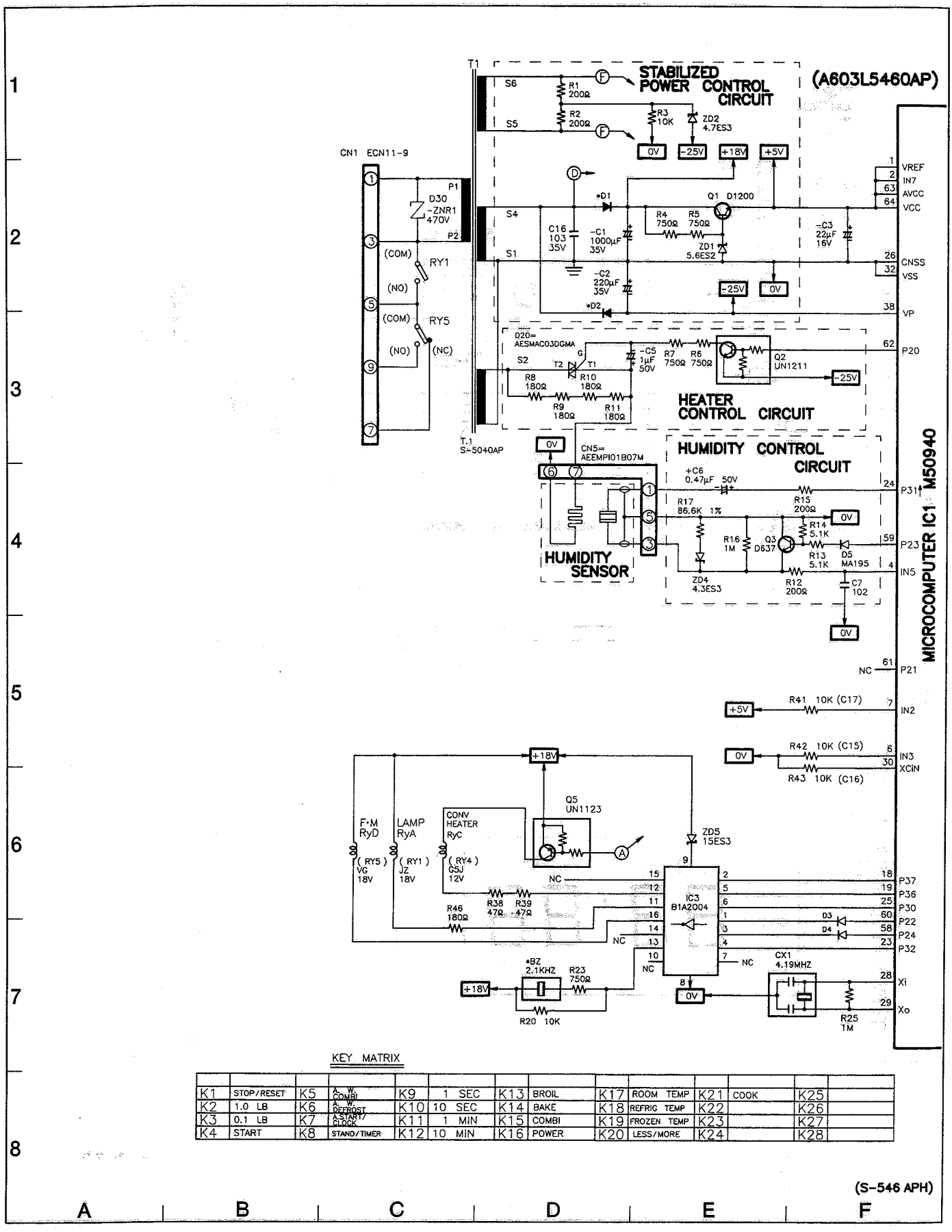



| IC-1 PIN NO. | IC-1 SYMBOL NO. | WAVEFORM |
|---|---|---|
| 8 | IN1 | 16.7mS, 5V, 0V |
| 29 | Xo | 0.24µS, 5V, 0V |
| 28 | Xi | 4.5V, 0V |
| 17 | P40 | 8mS, 1mS, 5V, 0V |
| 16 | P41 | 5V, 0V |
| 15 | P42 | 5V, 0V |
| 14 | P43 | 5V, 0V |
| 13 | P44 | 5V, 0V |
| 12 | P45 | 5V, 0V |
| 11 | P46 | 5V, 0V |
| 41 | P15 | 16.7mS, 2mS, 5V, -25V |
| 42 | P14 | 5V, -25V |
| 43 | P13 | 5V, -25V |
| 44 | P12 | 5V, -25V |
| 45 | P11 | 5V, -25V |
| 46 | P10 | 5V, -25V |

(S-545 APH)

# DIGITAL PROGRAMMER CIRCUIT (NN-9809, NN-9859)

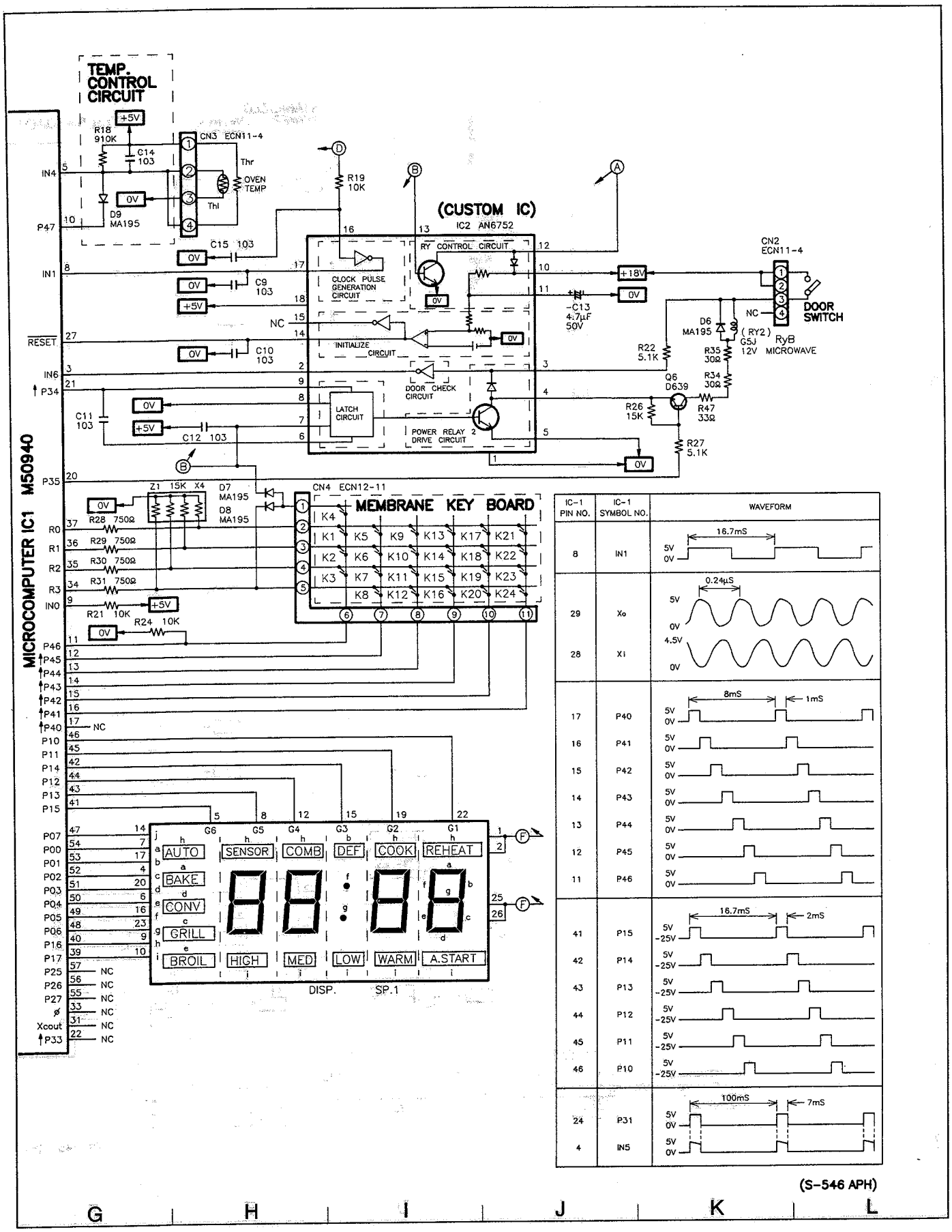
## SCHEMATIC DIAGRAM




KEY MATRIX

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K1 | STOP/RESET | K5 | A·W COMBI | K9 | 1 SEC | K13 | BROIL | K17 | ROOM TEMP | K21 | COOK | K25 |
| K2 | 1.0 LB | K6 | A·W DEFROST | K10 | 10 SEC | K14 | BAKE | K18 | REFRIG TEMP | K22 | | K26 |
| K3 | 0.1 LB | K7 | A·START/CLOCK | K11 | 1 MIN | K15 | COMBI | K19 | FROZEN TEMP | K23 | | K27 |
| K4 | START | K8 | STAND/TIMER | K12 | 10 MIN | K16 | POWER | K20 | LESS/MORE | K24 | | K28 |

(S-546 APH)

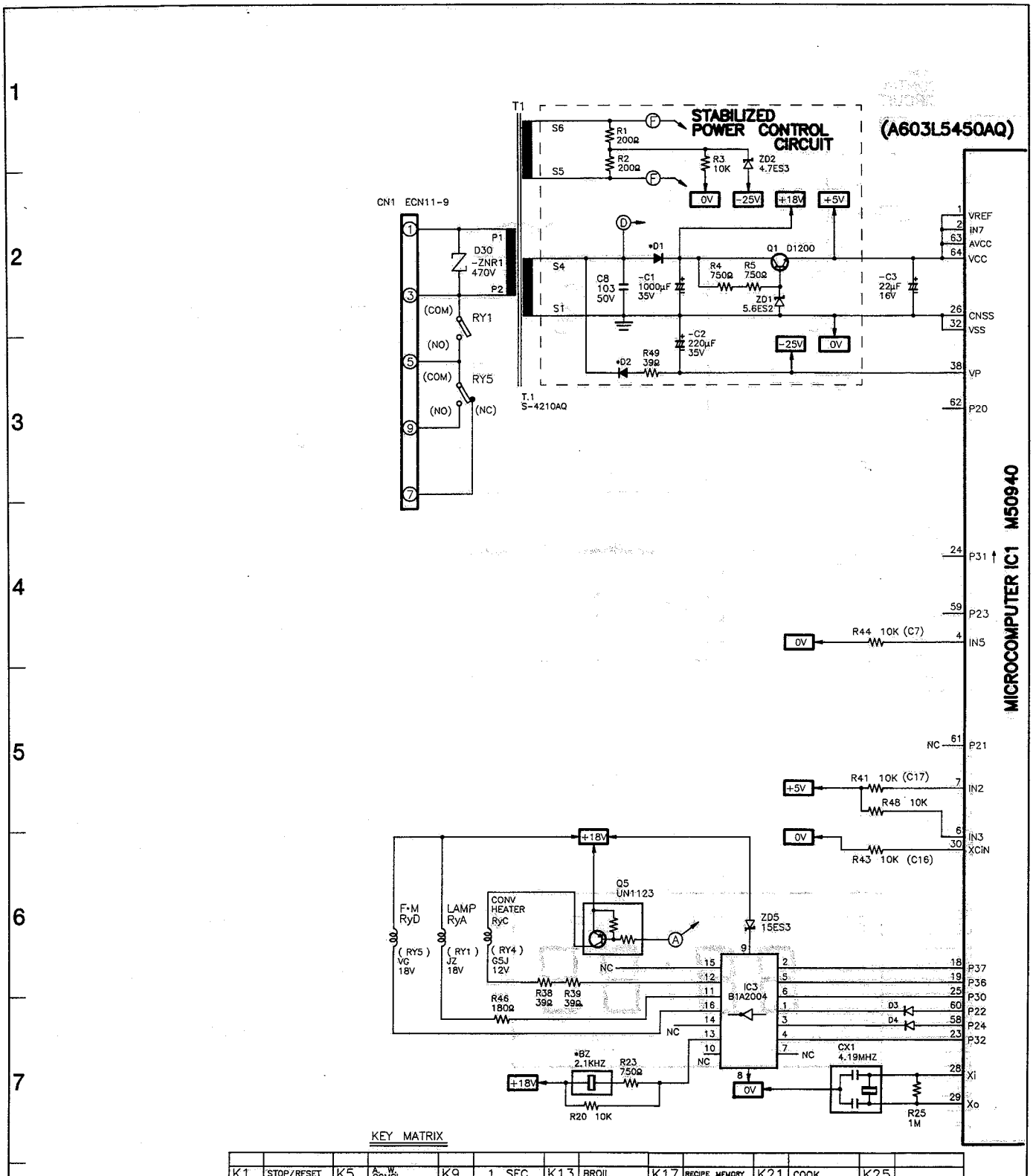



| IC-1 PIN NO. | IC-1 SYMBOL NO. | WAVEFORM |
|---|---|---|
| 8 | IN1 | 16.7mS, 5V, 0V |
| 29 | Xo | 0.24μS, 5V, 0V |
| 28 | Xi | 4.5V, 0V |
| 17 | P40 | 8mS, 1mS, 5V, 0V |
| 16 | P41 | 5V, 0V |
| 15 | P42 | 5V, 0V |
| 14 | P43 | 5V, 0V |
| 13 | P44 | 5V, 0V |
| 12 | P45 | 5V, 0V |
| 11 | P46 | 5V, 0V |
| 41 | P15 | 16.7mS, 2mS, 5V, -25V |
| 42 | P14 | 5V, -25V |
| 43 | P13 | 5V, -25V |
| 44 | P12 | 5V, -25V |
| 45 | P11 | 5V, -25V |
| 46 | P10 | 5V, -25V |
| 24 | P31 | 100mS, 7mS, 5V, 0V |
| 4 | IN5 | 5V, 0V |

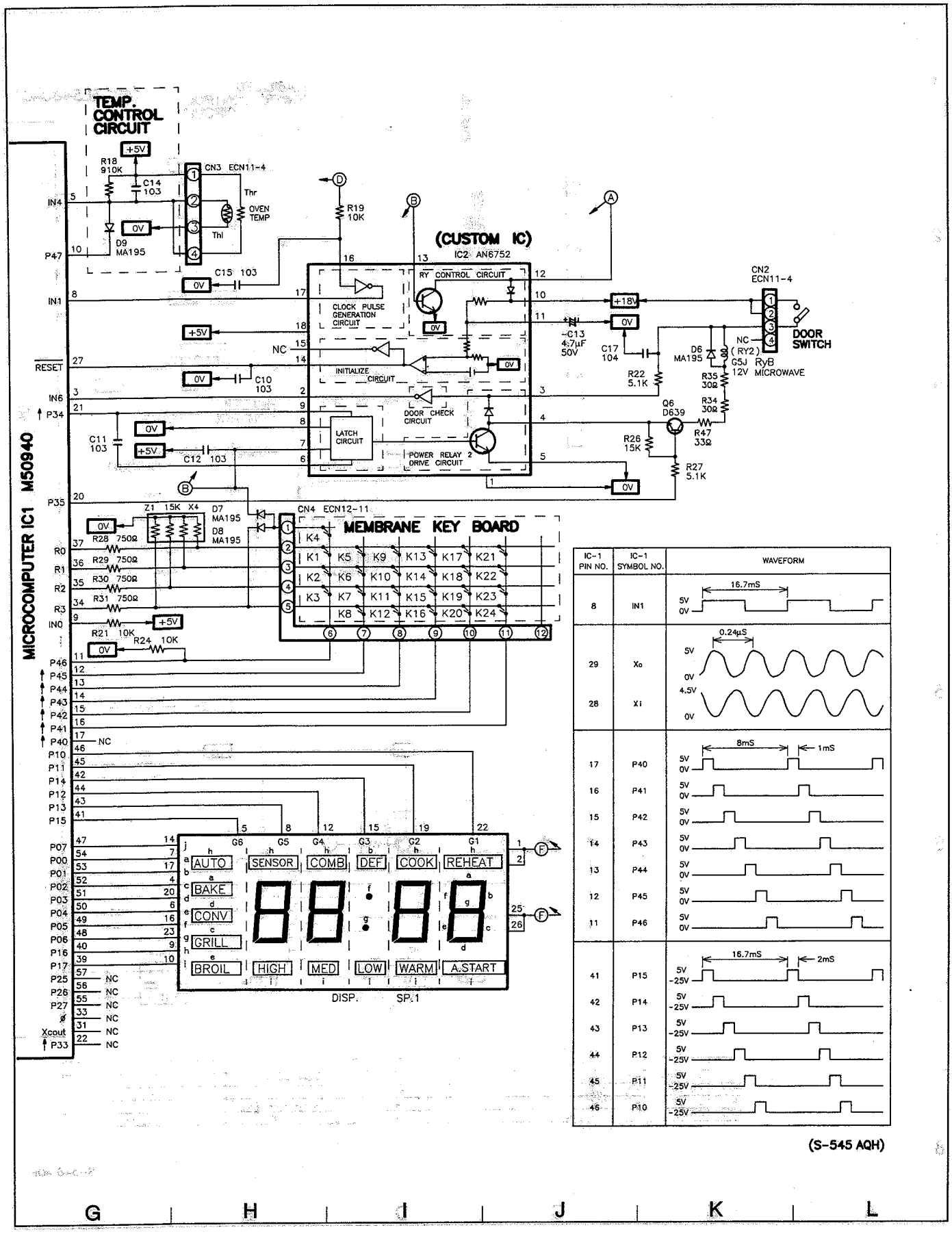
(S-546 APH)

# DIGITAL PROGRAMMER CIRCUIT (MQ8869W)

## SCHEMATIC DIAGRAM




| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K1 | STOP/RESET | K5 | A. W. COMBI W. | K9 | 1 SEC | K13 | BROIL | K17 | RECIPE MEMORY | K21 | COOK | K25 | |
| K2 | 1.0 LB | K6 | DEFROST C. W. | K10 | 10 SEC | K14 | CONVECTION | K18 | REHEAT | K22 | | K26 | |
| K3 | 0.1 LB | K7 | START/ CLOCK | K11 | 1 MIN | K15 | COMBI | K19 | SENSOR REHEAT | K23 | | K27 | |
| K4 | START | K8 | STAND/TIMER | K12 | 10 MIN | K16 | POWER | K20 | MORE/LESS | K24 | | K28 | |

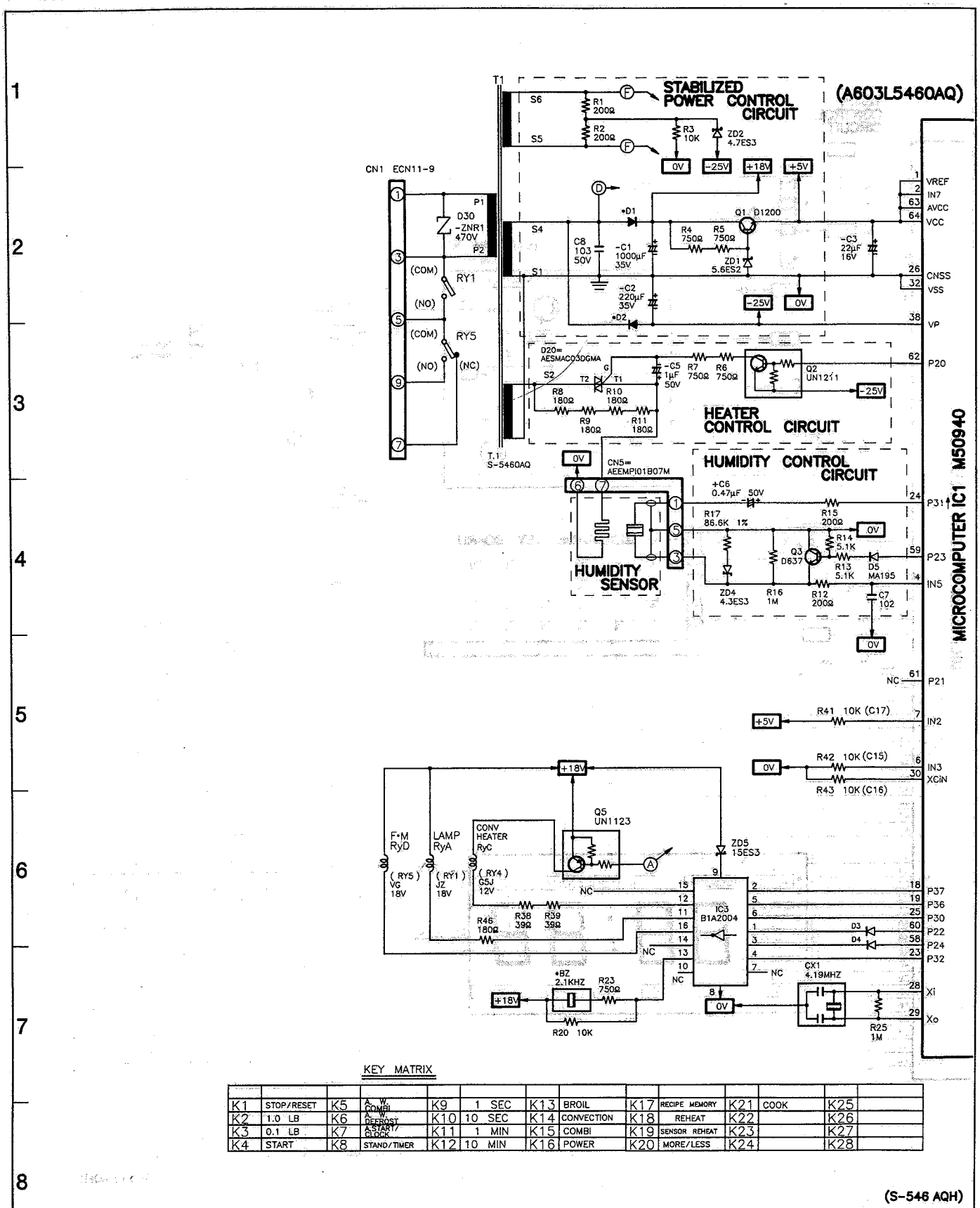


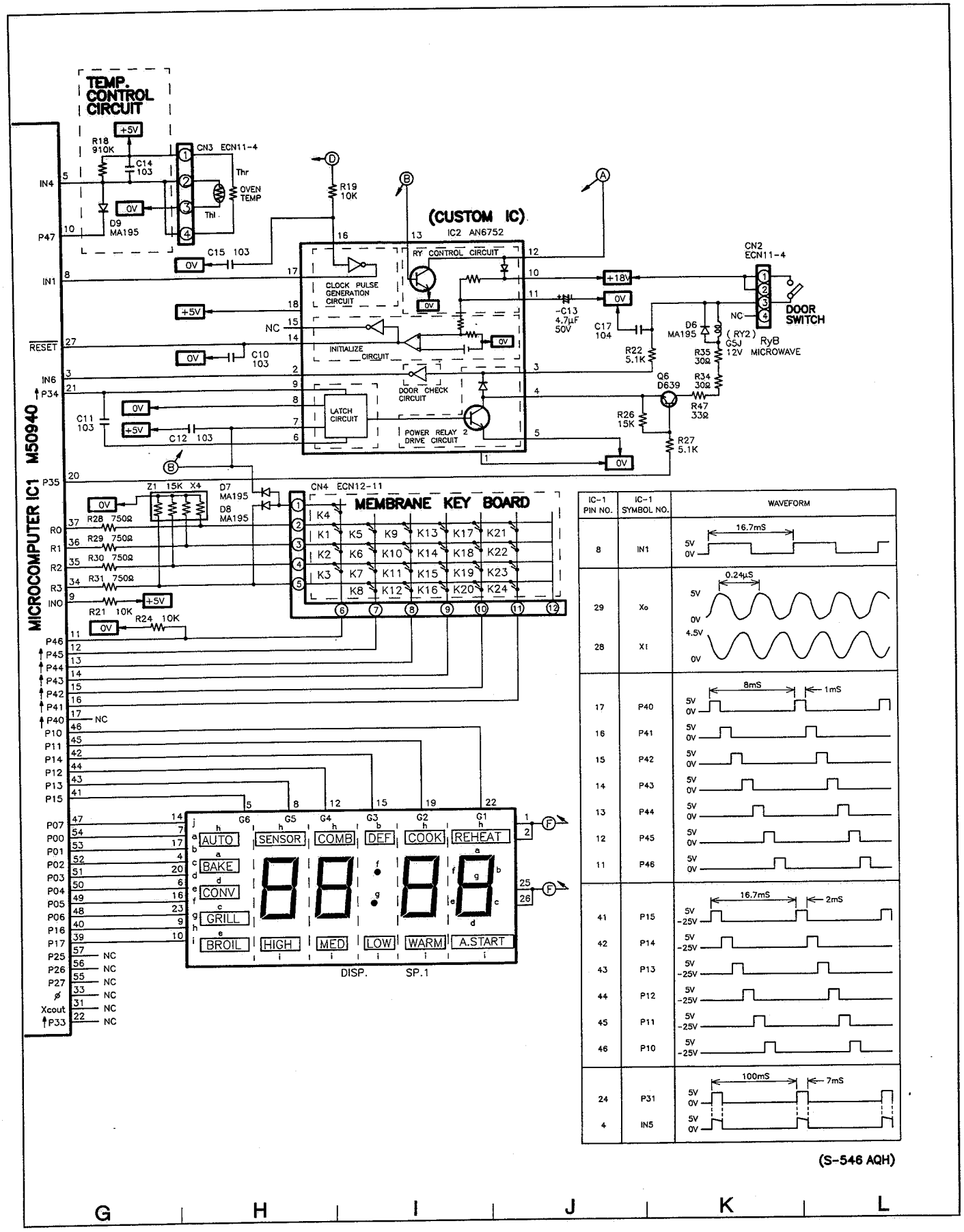

| IC-1 PIN NO. | IC-1 SYMBOL NO. | WAVEFORM |
|---|---|---|
| 8 | IN1 | 16.7mS, 5V, 0V |
| 29 | Xo | 0.24μS, 5V, 0V |
| 28 | Xi | 4.5V, 0V |
| 17 | P40 | 8mS, 1mS, 5V, 0V |
| 16 | P41 | 5V, 0V |
| 15 | P42 | 5V, 0V |
| 14 | P43 | 5V, 0V |
| 13 | P44 | 5V, 0V |
| 12 | P45 | 5V, 0V |
| 11 | P46 | 5V, 0V |
| 41 | P15 | 16.7mS, 2mS, 5V, -25V |
| 42 | P14 | 5V, -25V |
| 43 | P13 | 5V, -25V |
| 44 | P12 | 5V, -25V |
| 45 | P11 | 5V, -25V |
| 46 | P10 | 5V, -25V |

(S-545 AQH)

# DIGITAL PROGRAMMER CIRCUIT (MQ8899W)

## SCHEMATIC DIAGRAM




TEMP. CONTROL CIRCUIT
MICROCOMPUTER IC1 M50940
(CUSTOM IC)
IC2 AN6752
RY CONTROL CIRCUIT
CLOCK PULSE GENERATION CIRCUIT
INITIALIZE CIRCUIT
DOOR CHECK CIRCUIT
LATCH CIRCUIT
POWER RELAY 2 DRIVE CIRCUIT
MEMBRANE KEY BOARD
CN3 ECN11-4
CN4 ECN12-11
CN2 ECN11-4
DOOR SWITCH
MICROWAVE
AUTO
SENSOR
COMB
DEF
COOK
REHEAT
BAKE
CONV
GRILL
BROIL
HIGH
MED
LOW
WARM
A.START
DISP.
SP.1
IC-1 PIN NO.
IC-1 SYMBOL NO.
WAVEFORM
16.7mS
0.24μS
8mS
1mS
2mS
100mS
7mS
(S-546 AQH)

# MEMO